Commercial Fisheries Abstracts

a monthly summary of important developments for the fishery industries

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Vol. 7 No. 2 February 1954

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Washington D.C.

UNITED STATES
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DOUGLAS McKAY, Secretary

FISH AND WILDLIFE SERVICE
JOHN L. FARLEY, Director

Commercial Fisheries Abstracts

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The abstracts in this leaflet may be left in their present form; but it is suggested that to make the most efficient use of them, they be cut out on the lines designated and filed by the number in the upper left-hand corner of each. For a full description of this filing system see "Fishery Technological Abstract Card System" by Maurice E. Stansby and K. L. Osterhaug, Fishery Leaflet No. 232, obtainable free by request from Fish and Wildlife Service, Washington 25, D. C.

In addition to the regular abstracts, there is included a bibliography of references of secondary importance (without abstracts). These may be cut off on the lines designated and pasted on standard 3 x 5-inch cards for filing.

Following is a brief outline of this filing system. The numbers apply to the first digit appearing on each card. For the meaning of subsequent digits, please see the above described leaflet.

0	General and theoretical	5	Vitamins
1	Fish by species	6	Fishery byproducts
2	Fresh fish	7	Analytical Methods
3	Preserved fish	8	Composition
4	Oils	9	Miscellaneous

Issued with the approval of the Bureau of the Budget, December 29, 1953

9.2 QUARTERLY OUTLOOK FOR MARKETING FISHERY PRODUCTS, JANUARY - MARCH, 1954

Anonymous
Fishery Leaflet 336s, United States Department of the Interior, Fish and Wildlife Service
Washington 25, D. C. (January, 1954)

This report is the twentieth in a series of appraisals of economic conditions with predictions of marketing prospects for fishery commodities. The current issue forecasts the market outlook for some 50 specific fishery commodities over a three-month period. In addition, the publication gives a summary of the situation in fishery commodities generally, with some reference to the market conditions for other foods. The report runs to 32 pages and is illustrated with over 60 charts.

A summary of the major features of the bulletin is carried under the heading, "The Outlook at a Glance." In this summary, a fairly high rate of business activity, with continued large consumer income and expenditure, is forecast. The market for foods, generally, will be steady, with large supplies and a good demand. Among the classes of fishery commodities, edible fishery products as a whole are expected to find a good market. The market for most canned and cured fishery products is expected to be steady or firm. Among the byproducts, a steady market for fish meal is predicted, with a dull market for fish oils, and a weak market for fish-liver oils.

The productivity of the fisheries is expected to be seasonally low during the quarter. Holdings of frozen fishery products in cold storage are moderate for salt-water and fresh-water fish, but rather high for some shellfish, especially shrimp.

(over)

 ABSTRACTER: Wm. H. Dumont

6.71 PREPARATION, PROPERTIES, AND CRYSTALLIZATION OF TUNA PEPSIN

Norris, Earl R. and Mathies, James C. (University of Washington, Seattle)
Journal of Biological Chemistry 204, No. 2, 673-680 (October, 1953)

The authors developed a method for purifying and crystallizing pepsins from yellowfin tuna, Thunnus albacares, bluefin tuna, Thunnus thynnus, and albacore, Thunnus germo. Stomachs from these fish were collected in California and shipped under refrigeration to Seattle where they were washed and placed in frozen storage.

After many modifications the following procedure was used for preparing and purifying the enzyme: Extract 725 g. of ground mucosa with 3 liters of distilled water for 1 hour and strain the mixture through gauze. Wash the residue with 500 ml. of distilled water. Combine these washings with the original extract, acidify with 1 normal HCl to a pH of 3, mix in 100 g. of filter aid, and filter with suction. To each 100 ml. of the filtrate add 27 g. of solid $(NH_4)_2SO_4$ and dissolve slowly by stirring, then add 30 g. of filter aid, filter, and wash the cake with 0.44 saturated $(NH_4)_2SO_4$ in 0.1 normal acetic acid. Remove the cake from the filter, extract it with 750 ml. of 0.1 normal HCl for 30 minutes, filter, and wash with 150 ml. of 0.1 normal HCl. Add 4 molar sodium acetate to this filtrate until a pH of 3 to 4 is reached; then add dropwise, while stirring slowly, 54 ml. of saturated $(NH_4)_2SO_4$ solution for each 100 ml. of enzyme solution. Filter the suspension on sintered glass and wash the cake with 30 ml. of 0.44 saturated $(NH_4)_2SO_4$ in 0.1 normal acetic acid. Crystalline pepsin enzyme is available from solutions of the cake material when fresh mucosa of high enzymatic activity is used as the starting material.

Photomicrographs of crystals of the gastric proteolytic enzyme obtained from yellowfin tuna, bluefin tuna, and albacore are shown in figure 1, omitted. All three enzymes crystallized in the

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 ABSTRACTER: Martin Heerdt

6.15 FISH SOLUBLES -- THEIR CONSISTENCY

Anonymous
Meld. SSF, No. 7, 139-145 (1951)
Food Science Abstracts 25, No. 6, 645 (November, 1953)

Factors affecting the viscosity of the water-soluble, clear (desludged) concentrate of stick-water were investigated. Samples of clarified vacuum-evaporated stickwater, containing about 50% of dry matter, of pH 5.1 and 6.2, were heated in closed tubes to various temperatures. Viscosity decreased considerably only at temperatures as high as 130° to 140°; and changes at 150° C after 1 to 4 hours are shown graphically; the decreases were somewhat greater in the more acid samples. The breakdown of proteins, to which the changes of viscosity are due, was investigated by means of precipitation with zinc sulphate during heating of the samples and determining the "protein", "semi-protein" and "lesser protein" fractions. The best chemical criterion of the viscosity of stickwater is perhaps the determination of the lower nitrogen compounds (not precipitated upon saturation with zinc sulphate), which increase according to the increase in temperature. In commercial practice, the amount of sludge, especially of the bottom phase, has the greatest influence on the viscosity of stickwater concentrates. It appears that the amount of sludge should not exceed 15% of the dry matter, i.e. an excess of sludge above 0.7 to 0.8% in the original stickwater of ordinary winter herring may be harmful.

 Reprinted in whole

6.131 MECHANICS OF SOLVENT EXTRACTION WITH THE IMMERSION TYPE EXTRACTOR

Moore, N. Hunt
Journal of the American Oil Chemists' Society 30, No. 11, 538-539 (November, 1953)

Immersion-type extractors have both advantages and disadvantages when compared with basket extractors. Some of the advantages are: (a) much lower initial investment; (b) greater flexibility in moisture and particle size; and (c) less building space. Some of the disadvantages are: (a) more fines due to the agitation of the flakes during extraction; (b) the necessity of providing larger filters for an immersion type of extractor; and (c) more power requirement to drive the extractor.

Two types of continuous solvent extractors developed during the early 1920's have been introduced into this country. One was of the basket type and the other of the immersion type.

A cross-section view of the introduced immersion-type extractor is shown in figure 1. The flakes to be extracted are fed into the top of one of the legs and are conveyed downward through the solvent by means of a perforated screw. At the bottom of this leg a horizontal screw carries the flakes over to the other leg of the extractor. This "up leg" is rifled to prevent the mass of flakes from turning with the screw and to enable them to be conveyed upward through the solvent to a point several feet above the solvent level. This permits the excess solvent to drain from the extracted flakes.

The fresh solvent is introduced into the "up leg" and flows down, across, and up the "down leg" in a true counter-current manner. The solvent, rich with extracted oil, flows through a wedge wire or a perforated metal screen and on out to a receiving tank. It is necessary to filter this miscella before it is sent to the distillation equipment.

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 ABSTRACTER: Kathryn L. Osterhaug

QUARTERLY OUTLOOK REPORT

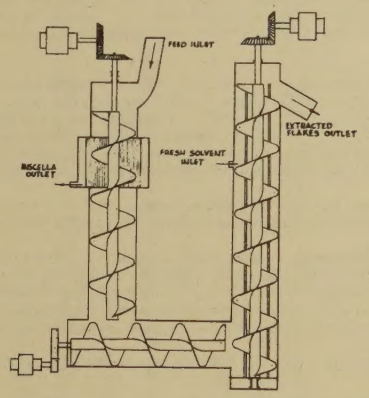
VISCOSITY OF STICKWATER CONCENTRATES

PREPARATION OF TUNA PEPSIN

IMMERSION-TYPE SOLVENT EXTRACTORS

6.131

Two modifications of this type of extractor are described and illustrated.



9.2

Importation of frozen edible fishery products is expected to be at a lower rate, and at a slightly higher level for shellfish and canned fish than for the first quarter of 1953. The export market is expected to be dull and the volume of exports of fishery products, with the exception of fish oils, will be relatively small.

The Outlook Report forecasts a strong market for swordfish, lake trout, spiny lobster, and croaker, and an active market for canned salmon. A firm or fairly firm market is predicted for haddock, halibut, pollock, canned sardines, fresh and frozen salmon, canned mackerel, red snapper, sablefish, whitefish, lobsters, fresh oysters and canned shrimp. A steady market is forecast for bluefish, cod, flounder and sole, ocean perch, sea bass, sea trout, fresh clams; canned anchovies, tuna and oysters; and salt herring and mild-cured salmon. Items expected to have a fairly steady market are butterfish, canned herring, mackerel, scup, smelt, whiting, fresh and canned crab meat, shrimp, buffalofish, carp, catfish, lake herring, sheepshead, and yellow pike. An unsettled market is anticipated for mullet. A dull market for scallops is expected, and a weak market for rockfish.

6.71 (Cross Reference: 1.1)

form of fine needles that resembled salmon pepsin but not swine or bovine pepsin. Specific activities of 4 different fish pepsins, 2 swine pepsins, 1 shark and 1 bovine pepsin are given in table 1, omitted.

In earlier attempts to purify the various enzymes, the solubility of yellowfin tuna pepsin was found to be less than that of other pepsins. Yellowfin tuna pepsin was almost entirely precipitated in 0.35 saturated ammonium sulfate at pH 3. A study concerned with the alkaline extraction of gastric mucosa showed yellowfin tuna pepsin to be inactivated by alkali at about pH 8, whereas swine pepsin was inactivated at about pH 7.

Inactivation by heat was also studied. During 5 minutes of heating at pH 2, yellowfin tuna pepsin was 50 percent inactivated at 56° C., whereas swine pepsin did not become 50 percent inactivated until the temperature rose to 63° C. The optimum temperature for the enzyme activity of yellowfin tuna pepsin was near 42° C. when studied over a temperature range of 5 to 55° C. Yellowfin tuna pepsin gave a pH activity curve with two optima in the absence of salts and increased activity with one optima in the presence of buffer salts. Under the latter conditions, the optimal pH observed for the hydrolysis of hemoglobin was about pH 2.5. The pH of minimal solubility or apparent isoelectric point was 3.8 ± 0.25 in the presence of acetate buffers.

7.80 SENSORY TESTS AND CONSUMER ACCEPTANCE

Harries, J. M.
Journal of the Science of Food and Agriculture 4, No. 10, 477-482 (October, 1953)

The relationship between the consumer acceptance test and the analytical taste-panel test in the assessment of foodstuff quality is discussed. The consumer-acceptance panel is composed of a large number of people, and these people must be representative of the consuming public; the analytical panel is composed of a few people who usually possess some special acuity of taste or perception. In the consumer-acceptance test, the preference of the consumer is required; the result is usually that a certain proportion of the public prefer "A" and a certain proportion prefer "B". Any experimental error of the test will be a sampling error of a proportion. In the analytical panel test, the object is to analyze; therefore the system of scoring must consist of as many precise, mutually exclusive, and exhaustive descriptions as possible. Members of the panel must agree on the definition of the terms used. In the analytical test an average result is required; therefore, the judges taking part should agree with each other to some degree. The dispersion of individual values about that average value is treated as experimental error.

The author believes that in the analytical evaluation each food product should be examined and evaluated for each of its properties separately. "Over-all quality" has no place in analytical evaluation but is proper to a consideration of consumer acceptance. A comparison of over-all quality of two or more products to decide which is most desirable to a consumer can be best accomplished by a consumer-acceptance test. If an analytical taste-panel finds no significant difference between two products, it is usually concluded that the proportion of the consuming public that could tell the difference is probably small. If the panel finds a significant difference, then a consumer test must be carried out if the consumer preference of the product is desired. The analytical test is not a short cut for the consumer-acceptance test.

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 ABSTRACTER: D. T. Miyauchi

7.80 THE OBJECTIVE APPROACH TO SENSORY TESTS OF FOOD

Ehrenberg, A. S. C. and Shewan, J. M.
Journal of the Science of Food and Agriculture 4, No. 10, 482-490 (October, 1953)

To establish an objective approach to sensory tests of food, the following procedure is suggested: "(i) Take a given limited array of sensory phenomena, e. g. the various flavours, odours, etc. of fish that are known to occur during the process of spoilage under given conditions of storage. (ii) Deliberately devise descriptions for these phenomena, and possibly attach numerical symbols to them for greater convenience. (iii) Train people to use the same description for any given phenomenon. (iv) Observe empirically whether the descriptions are used consistently, and discover the factors which, if controlled or otherwise taken care of, will increase this consistency."

In order to achieve objective descriptions -- terms that are independent of the observer and of the time of assessment -- personal preference or the idea of consumer reaction must be excluded. The choice of descriptive terms is difficult because certain flavors or odors may be altogether new or because the terms for sense perceptions that are reminiscent cannot always be agreed upon. Ambiguous terms such as "excellent", "bad", "strong", or "weak" should be avoided. The aim is to find terms that are unambiguous and in common usage, e. g., chemicals whose flavor and odor are generally agreed upon.

The importance of training the panel of judges in sensory tests of food is recognized. The objective is to have the judges agree on the use of given descriptive terms and scores. "The training consists essentially in the actual physical examination and discussion (in terms of the scoring system) of fish covering the whole possible range of spoilage; for the statistical analysis it has been found that the internal consistency of a panel can be usefully described by systematic differences between the scoring-levels of the panel-members ('biases') and by some measure of the scatter; e. g. variances or standard deviations, of their more or less random discrepancies." For trained panel members the biases have been found to be up to about half a unit on the 10-point scales used, and the

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 ABSTRACTER: D. T. Miyauchi

7.641 REPORT ON VITAMIN B_{12} (MICROBIOLOGICAL METHODS)

Krieger, Carl H. (Wisconsin Alumni Research Foundation, Madison)
Journal of the Association of Official Agricultural Chemists 36, No. 3, 846-856 (August 15, 1953)

The method used was basically the U. S. P. XIV method. It was modified in the 1951 A. O. A. C. study to allow a turbidimetric evaluation and further modified in the present study to include more specific instructions for sample treatment, basal medium preparation and procedure. Tomato juice was omitted from the medium. The buffered bisulfite treatment of samples was used. Each sample was assayed on three separate days to determine intra- as well as interlaboratory agreement.

The samples assayed were as follows: Sample A was a water-phenol solution of cyanocobalamin Reference Standard U. S. P., prepared to contain 15 mmg. of vitamin B_{12} per ml. A food dye was used to give the solution a yellow color. Sample B was a commercial 50 percent condensed fish solubles. Sample C was a commercial vitamin B_{12} antibiotic feed supplement containing adsorbed vitamin B_{12}. Sample D was evaporated milk purchased on the open market. Three cans of each were sent to each collaborator to permit use of an unopened can on each of the three assay days.

Details of the assay are described. A summary of the values obtained for the four samples is given. The best results were obtained on sample A, the U. S. P. Reference Standard. A much greater variation in both inter- and intralaboratory results occurred with B, the condensed fish solubles. There was less variation with C, antibiotic feed supplement, than with B, but more than with A. The difference between A and C indicated that there is still difficulty in the elution and/or stabilization of vitamin B_{12} or its analogs.

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 ABSTRACTER: Neva L. Karrick

7.6139 REPORT ON VITAMIN A IN MIXED FEEDS

Cooley, Maxwell L.
Journal of the Association of Official Agricultural Chemists 36, No. 3, 812-819 (August 15, 1953)

Collaborative study of the procedure for the determination of Vitamin A in mixed feed, First Action, was continued in 1952. Results of this study indicated slightly less accuracy in applying the method than in the previous collaboration. In part, this may be due to the use of generally less potent samples in the present work. One sample approached the lower sensitivity limit of the method, containing between 2 and 3 units of A per gram. Considering that 1 unit of Vitamin A is equivalent to 0.344 mmg. of Vitamin A acetate, the method appears to be reasonably satisfactory for determining one or less p. p. m. of Vitamin A. As was pointed out in a previous report (1), because saponification is necessarily omitted, the interference of lipids and other extracted materials reduces the accuracy, especially when the procedure is applied to feeds containing low amounts of Vitamin A.

One collaborative sample in the present study was a feed having dried milk products as one of its main components. Results indicate the method applies about as well to this type of material as it does to regular poultry mashes.

Because of the availability of dry Vitamin A products for use in feeds which are stabilized by embedding the Vitamin A in a matrix of either gelatin or pectin, a modification of the present method is necessary. The proposed procedure employing saponification, as given in this report, is being investigated for applicability to feeds containing the above stabilized Vitamin A products. Saponification eliminates certain lipid interference, but because of the change in the chromatography, probably all of the carotene derived from the feed is present in the final Vitamin A solution. Influence

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 Author's summary

SENSORY TESTS AND CONSUMER ACCEPTANCE

MICROBIOLOGICAL ASSAY OF VITAMIN B_{12}

SENSORY TESTS

DETERMINATION OF VITAMIN A IN FEEDS

7.641

Results on evaporated milk (D) indicated that there is greater intra- and interlaboratory variation if a sample has an extremely low vitamin B_{12} content, i.e., 1.0 millimicrogram of vitamin B_{12} per ml.

In general, good inter- and intralaboratory agreement was obtained, particularly with higher potency samples. Intralaboratory agreement was better than that between laboratories. The present study also confirmed the use of the bisulfite treatment, although further consideration should be given this phase. The study also supported the contention that a turbidimetric assay is possible. One collaborator indicated that better results were obtained after 40 hours of incubation rather than 16. However, similar situations have been rectified by the use of a more active inoculum which can be obtained by frequent transfer of the microorganism within a given day.

From the data and comments there is still room for improvement of the assay. There were contradictory comments on the extent of the usable portion of the standard curve, the percentage of light transmission in the blanks, and the activity of the microorganism. Occasionally there were very high or low results. Particular attention to the use of scrupulously clean glassware, length of time and manner of sterilization, and the maintenance of identical conditions for cooling the tubes often decreases the difficulties.

Results of both the 1951 and 1952 studies indicated that the method is sufficiently satisfactory for general use on materials ranging from approximately 1-10 mg. of vitamin B_{12} per pound.

7.6139

of this carotene in the blue color reaction must therefore be substracted. Further study of the modified method may indicate that it could be applied to the determination of Vitamin A in feeds without regard to source of the A. Possibly simultaneous determination of the carotene in feeds also could be accomplished.

7.80

If the food products are fairly homogeneous and can be tested simultaneously, the direct-difference test is particularly useful. In the triangular test, where two samples of A and one of B are presented and the judge is asked to select the odd sample, the chance of giving the correct answer by guesswork alone is one in three. The author prefers to present two samples of A and three of B, in which case the chance of guessing correctly is reduced to one in ten.

Data are presented in Table II to illustrate some aspects of the limitations of the organoleptic techniques.

Table II

Analysis of variance of results from an experiment with potatoes when an arbitrary scale of intensity of an off-flavour is used

Source of variance	Degrees of freedom	10.30 a.m. Mean square	10.30 a.m. F ratio	11.30 a.m. Mean square	11.30 a.m. F ratio	3.0 p.m. Mean square	3.0 p.m. F ratio
Between treatments	3	1·8014	3·07	4·9906	8·90	0·4097	1·19
Between samples within treatments	8	1·6031	2·73	3·3447	5·96	0·7917	2·30
Between judges	3	0·2986	—	0·5764	1·03	0·4653	1·35
Residual	33	0·5865		0·5612		0·3441	
Total	47						

Some of the interesting features aside from the treatment effect are: (1) effect of time of day upon the performance of the taster, (2) tests of internal consistency normally carried out with such data, (3) in each of the analyses the variation due to observers is less than the variation due to samples within treatment.

"Another item of interest in Table II is that, when the significance of the treatment effect is tested, we ignore completely the variation due to observers. This variation may be considerably larger than that due to any other source, but it does not matter how much the observers differ in their estimates of the samples included in the experiment, considered as a whole; it is the comparisons they are able to make between the samples of different treatments that are of interest in this type of test. This ignoring of the variation due to observers means that the treatment effects are more likely to prove significant, and this is valid only if the test is considered as a laboratory or analytical test. In a consumer-acceptance test, however, the variation due to observers is of prime importance."

7.80

error variance for each panel member is almost always less than one unit, and often well under half a unit.

Two sets of organoleptic results collected with untrained and partially-trained personnel, respectively, are presented. For the untrained personnel, it was broadly concluded that despite the biases that were found to be almost always statistically significant, and the large discrepancies that are even less systematic, the untrained panel of 10 or more does succeed on the average in putting samples more or less in their "correct" order. Although the data for the partially-trained personnel was limited to only 2 persons who joined a trained panel of 4 members, the results are of interest because of the availability of control readings. In general, the partially-trained panel members, aside from a bad start, were very consistent for very fresh and very stale fish; however, for the intermediate-quality fish, they were much more erratic in the first two sessions held on the same day. They showed considerable improvement in the 3rd session held 6 weeks later, with additional experience gained in the interval.

It is concluded that people making organoleptic assessments of fish in terms of the scoring system tend on the average to agree; the internal panel scoring consistency can be increased by explicit training. In trying to establish objectivity, by which the results are more or less independent of the personnel and the time of assessment, there is the fundamental difficulty that one is not certain whether a given sample is exactly similar and therefore should be given the same score as any sample examined previously or samples handled by someone else. The problem is to (1) find known standards or control samples of one kind or another; (2) find a constant relationship of a sensory variable with an operationally independent one, such as some physicochemical measure; (3) accumulate many pieces of evidence which makes the objectivity of the assessment more plausible, i.e. results that are reproducible many times.

2.19 LOSS OF WEIGHT AND SHRINKAGE OF ICED FISH ON TRAWLERS

Cutting, C. L. (Department of Scientific and Industrial Research, Torry Research Station)
Fishing News, No. 1975, 10 (1951), D.S.I.R. Food Investigation Memoir No. 701

In the past two years a number of long-distance trips have been made by scientific observers aboard various Hull and Grimsby trawlers to study icing problems at first hand. The loss of weight by fish in ice aboard the trawler is one part of this study that is now ready for publication.

Fish for the experimental study were collected after gutting and washing, and a numbered metal tag was wired to the backbone near the tail of each. The fish were weighed, measured, and then tied together with twine in lots of six before being iced with the rest of the fish from the same haul. They were then stowed in ice either at the top, middle, or bottom of a pound or shelf. The tagged fish were recovered upon arrival in port during the normal unloading operations and weighed and measured usually within a few hours.

Table 1, omitted, summarizes the percentage losses in weight due to stowage. It appears that a loss of weight nearly always occurs when fish are stowed in ice aboard ship. Fish iced in boxes, however, usually gain 1 to 2 percent in weight during their stowage in ice. The reason for this gain in weight is believed to be due to pure water from melting ice being drawn in by the osmotic attraction of the fish flesh fluids. Loss of weight appears, therefore, to be merely an effect of pressure.

On each of four trips during which over 800 fish were weighed, the over-all average loss in weight of fish sampled throughout the entire four catches was about 5 to 6 percent. Haddock lost more water than cod when stowed in ice under the same treatment and for the same time. Plaice, by comparison, appeared to lose relatively little weight. Weight losses, in general, increased with any

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 ABSTRACTER: Martin Heerdt

2.00 THE EFFECT OF STANDING, HANDLING, AND SHIPPING ON FREE LIQUID, SOLIDS, AND SALT CONTENT OF OYSTERS

Daughters, G. T. and Hoshall, E. M. (Food and Drug Administration, Baltimore, Maryland)
Journal of the Association of Official Agricultural Chemists 36, No. 3, 947-954 (August 15, 1953)

I. Chesapeake Bay Area Oysters

A series of practical experiments designed to determine the effect of standing, handling, and shipping upon fresh Chesapeake Bay oysters was carried out with the aid of a number of collaborators. The average drained liquid from each of seven lots of oysters packed according to Federal Standards was measured over a period of from 1 to 19 days after packing and shipping to points 180 to 1122 miles from the packing plant. The quantity of liquid found on arrival was less than the drained liquid found within 15 minutes after packing. Out of a total of 89 samples, 5 were more than 15 days old and in a state of decomposition as a result of having become frozen and then thawed in transit to a collaborating laboratory. The drained liquid from these oysters was greater than the quantity originally determined by the plant inspectors.

In no instance did a sample of oysters in good condition "bleed" or lose water as a result of handling, storing, or shipping. According to the last horizontal line of table 2, omitted, the oysters absorbed or picked up from 0.9 percent to 3.7 percent of the drained liquid present after packing. The findings prove that Chesapeake Bay oysters do not leak during handling with consequent increase in drained liquid content.

The total solids and salt content of the foregoing oyster samples were also determined as a part of this study. These values remained uniform within the variations of the analytical method.

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 ABSTRACTER: Martin Heerdt

2.9 SHELLFISH POISONING FROM CALLISTRA BREVISIPHONATA (CARPENTER) AND ITS CLINICAL SYMPTOMS

Asano, Motokazu; Takayanagi, Fumio; and Kitamura, Teruko (Dept. of Fisheries, Faculty of Agriculture, Tohoku University, Sendai, and Mori Health Center, Hokkaido)
Tohoku Journal of Agricultural Research III, No. 2, 321-330 (March, 1953)

Twenty-six out of 115 people had become ill from eating Callistra brevisiphonata (Carpenter), a clam common to the Japanese coast. No correlation between freshness of the bivalves and occurrence of the poisoning could be observed. Symptoms appeared from one-half to one hour after ingestion. Clinical symptoms indicated possibility of allergic responses. Further evidence suggested that the outbreak was not due to accidental reasons such as bacterial infections and that the toxicity of the bivalves was seasonal and was at a peak in the spawning season.

The location of the toxic material could not be determined using mice, kittens, or dogs. However, using humans it was found to be located in the ovaries. After this was discovered, nine volunteers were fed ovaries of the clam. Both subjective and objective symptoms are recorded. Of the nine persons, one developed a severe reaction and one a lesser reaction. The person showing the severe reaction was given a hypodermal injection of 20 mg. of an antihistaminic drug and he recovered after a few hours.

Skin tests were run. Ovary, testes and digestive tracts were each extracted with pH-7.0 buffer. Injections of 0.05 ml. of the extract were given intracutaneously into the inner forearm. The reaction agreed with the results of the oral administration.

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 ABSTRACTER: Neva L. Karrick

4.4 THE CAUSE OF SOURING OF HERRING OIL

Anonymous
Meld. SSF, No. 8, 166-170 (1951)
Food Science Abstracts 25, No. 6, 645 (November, 1953)

Storage of mixtures of press liquid and oil (about equal quantities of oil and water) at temperatures from 0° to 100° C. showed, after 9 days, that the greatest formation of fatty acids occurred at about 37° C., indicating that souring was due either to enzymes or to microorganisms. After heating for 20 minutes at 120° C., the increase in fatty acids was comparatively insignificant; the role of inorganic catalysts is therefore practically negligible. After addition of only 5% of untreated press liquid to the sterilized sample, formation of fatty acids in the mixture was soon equal to that in the original press liquid, indicating that microorganisms and not enzymes were responsible for the increase. Addition of formalin, sodium nitrite, or boric acid arrested the increase in fatty acids; these chemicals could also be used to stabilize watery oil. The addition of iron salts or corrosion deposits to half the samples gave no definite results, but the role of iron and products of corrosion always seemed to be secondary. Since microorganisms thus appear to be the main cause of souring during storage of herring oil containing water, the necessity of great cleanliness in the factory is emphasized.

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STORAGE CHANGES IN ICED FISH

SHELLFISH POISONING

HANDLING FRESH OYSTERS

BACTERIAL SOURING OF HERRING OIL

2.9 (Cross Reference: 1.82)

Since the toxic substance occurs in the ovary, a simple method to distinguish between male and female clams is as follows: Smear a small amount of the white or yellowish-colored gonad on a thin glass plate. If a female, there will be white granular particles of ova and if a male, the smears will look like milky paste.

2.19

increase in the depth of stowage and the staleness of the fish. Cod 16 to 18 days in ice lost 10 to 13 percent in weight and haddock somewhat more. Individual fish lost as much as 17 to 18 percent in weight, whereas the average throughout the pen was between 8 and 9 percent for the first caught fish.

Fish at the top of the pen usually lost only 1 or 2 percent; and occasionally, even gained weight. However, after 15 or more days in ice the loss among top fish was often between 7 and 8 percent. Fish iced on shelves reacted very similarly to fish at the top of a pen, losing on the average about 2 1/2 percent in weight throughout a trip. In general, the results showed that less weight would be lost if more shelving were employed throughout the trip and particularly at the beginning when the least effort is usually made to stow fish at a minimum depth. Shallower depths of fish on shelves might have resulted in an increase of about 5 percent in the weight of the fish landed, or about 10 tons in a distant-water trip. This quantity of fish would bring £ 225, a sum that would more than pay for the cost of the ice carried. Conversely, the use of more shelves might retard the rate of stowage and increase the labor required.

The average fillet yields from fish stowed in pens as against fish stowed in boxes did not show any decided trend. Six fish that had been stowed in ice for 18 days at the bottom of the bottom pound lost an average of 13.9 percent in weight and yielded 45.5 percent fillets. By comparison, boxed fish that had lost no weight yielded 46.0 percent fillets. This finding implies that the edible flesh loses as much liquid as the offal. Enclosing the fish in rubber bags permitted collection of the liquid that was squeezed out when the fish were placed under pressure. This liquid contained about one-half as much protein as the flesh itself; consequently, a 6 to 7 percent weight loss is equivalent to a 3 percent loss in edible protein. The shrinkage in length that occurred between catching and landing of the fish amounted to only 0.68 percent.

2.00 (Cross Reference: 1.81)

II. River Oysters (Preliminary Studies)

Since some of the packers insisted that "river" oysters would leak even if the Chesapeake Bay oysters did not leak, the study was extended to include oyster samples from the Rappahannock, York, and Potomac Rivers. Three samples of standard oysters consisting of 48 pints each were examined over a period of from 1 to 16 days from the time of packing. River oysters, packed according to Federal standards did not increase in drained liquid. Actually, their drained liquid content decreased, because the oysters took up 0.9, 1.7, and 2.9 percent of the drained liquid originally present within 15 minutes after packing. Handling, storage, shipping, and age did not have any effect on their total solids and salt content.

4.64 ANTIOXIDANTS FOR FOOD PAPERS

Bentz, R. W (Eastman Chemical Products, Kingsport, Tenn.)
Modern Packaging 27, No. 1, 141-143 (September, 1953)

There are at least three ways in which wrapping papers can accelerate rancidity in fat-containing foods: (1) metallic contamination, (2) increased surface area, (3) admission of light.

Paper usually contains trace amounts of pro-oxidative metals. As little as 10 parts per million of iron or copper will reduce the keeping time of fats and oils by as much as 50 percent.

In bulk form, fats and fatty foods are not overly sensitive to oxidation because of the relatively small surface area; in the packaged state, however, the fat is absorbed by the paper and diffused to expose to the air a large surface area per unit weight of fat. The fat thus exposed readily develops the characteristics of oxidative rancidity. This may be brought about not only by the increased surface area, but by the catalyzing effect of the pro-oxidative metals in the paper.

The photochemical effect of light admitted by some packaging materials may also catalyze oxidation.

In recent work to determine the value of treating packaging materials with antioxidants, food-inhibitor-grade butylated hydroxyanisole (BHA) was found to be the best suited for most paper applications. The effectiveness of BHA-treated paper on the shelf life of various fats and oils is illustrated in a series of bar graphs.

It has been shown that antioxidants can easily be applied to parchment, glassine, and paperboard. Good results can be obtained by treating the unwaxed paper with 0.05-0.10 percent of BHA. The

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 ABSTRACTER: Roy C. Stevens

4.64 ANTIOXIDANT TREATMENT FOR BACON

Hanley, J. W.; Everson, C. W.; Ashworth, L. Q.; and Morse, R. E. (Kingan & Co., Indianapolis)
Food Technology 7, No. 11, 429-431 (November, 1953)

Stabilizing animal tissue fats in food products, bacon for example, is a difficult problem. The fatty portion of these foods breaks down in the presence of oxygen to form peroxides, aldehydes, ketones and other products which produce unpleasant flavors and odors. Prior studies indicate that a trained organoleptic panel usually gives a better index of the rancidity in fatty foods than chemical methods of analysis.

In adding stabilizing agents to animal tissue fats the antioxidant must be capable of interrupting the fat-oxygen reaction chain. Molecules of the antioxidant must be of a size that will pass readily through animal tissue cell walls, and they must have reasonable solubility to enter both the aqueous and the fat phase for dispersion throughout the tissue. In addition, the antioxidant must have a high inhibitory efficiency to permit the use of low concentrations; it must impart no flavor, color, odor or toxicity to the product; and it must be available at low cost.

In preliminary tests a machine designed for pumping pickle solution into bacon was used for antioxidant introduction. Hydroquinone (HQ), propyl gallate (PG), and citric acid (CA), alone and in various combinations, were first dissolved in a minimum amount of 95 percent ethyl alcohol before they were dispersed in the pickle solution. Butylated hydroxyanisole (BHA) was first dissolved in a minimum amount of lard, and this mixture was emulsified in an aqueous solution of 1 percent of a detergent commonly used for washing clothes.

Bacon pickle solutions containing, in addition, 0.20 percent PG, or 0.49 percent HQ, or 0.49 percent HQ and 0.20 percent PG, or 0.49 percent HQ and 0.002 CA, were injected into the bacon

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 ABSTRACTER: Martin Heerdt

6.9 SURVEY OF THE SPONGE FISHERIES OF LIBYA

Anonymous
FAO Fisheries Bulletin 6, No. 5, 205 (September/October, 1953)

Commercially exploitable sponge grounds are found all along the coasts of Libya extending from the shore out to depths of 55 fathoms and sometimes deeper. Sponges are most often found on rocky bottoms and on ledges, where the best quality specimens are obtained. They also occur on solid, silt bottoms strewn with small stones, boulders or mollusc shells.

Despite complaints of gradual depletion, statistics indicate that the quantity of sponges fished is in direct ratio to the number of boats operating in a season. Over-all production is greater than it has been in the past. However, there is a substantial decrease in production of the zimocca and fine Turkey cup varieties. A marked lowering of the quality of the sponges in the last ten years is indicated. This may be due in part to the more careful grading that has been required by the post-war market.

The fishing methods include both skin and suit diving, as well as the use of rakes and hooks. Most of the divers are equipped with some sort of submarine breathing apparatus and operate from the shore out to a depth of 230 feet; only a few work without any special equipment. Another method of sponge fishing involves the use of wide-mouthed rake dredges (gangava) dragged along the sea bottom at depths of 390 to 490 feet. Sponge hooks are also used in shallow waters under 80 feet in depth. The method requiring diving suits and breathing apparatus is the most complicated and requires a considerable capital outlay. It also requires highly experienced crews; many of these divers are lost each year. Gangava fishing requires a knowledge of navigation. Those fishing with sponge hooks and those using small boats and unassisted divers require only elementary knowledge and a very

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 ABSTRACTER: Roy C. Stevens

6.135 THE DEODORIZATION OF EDIBLE OILS

Boyle, J. L.
Food 21, 372-376 (1952)
Food Science Abstracts 25, No. 6, 678 (November, 1953)

Since deodorization consists essentially of steam distillation under high vacuum, the main controlling factors in the process are the operating pressure and temperature and the amount and temperature of the blowing steam. A low operating pressure (1) increases the rate of deodorization, (2) decreases the risk of oxidation, and thus permits the use of higher temperatures, and (3) lessens the extent of hydrolysis of the oil. A fairly high temperature (up to 250° C.) is favoured because the vapour pressure of the impurities increases near their boiling point, but, on the other hand, the tendency of the oils to polymerize and the amount of hydrolysis become greater. In theory, the rate of deodorization increases with increase of weight of blowing steam, up to the point at which the vacuum on the equipment is adversely affected, but, in practice, the rate depends more on the area of interfacial contact between the steam and oil; consequently, deodorization stills are usually made with the diameter large in proportion to the depth. For most efficient operation, the temperature of the injected steam should be the same as that of the oil when the 2 come into contact. The design and operation of deodorization systems is discussed, and flow diagrams show the Foster Wheeler Dowtherm systems for batch and continuous methods.

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ANTIOXIDANTS FOR FOOD PAPERS

SPONGE FISHERIES OF LIBYA

ANTIOXIDANT STUDIES

DEODORIZATION OF OILS

6.9 (Cross Reference: 1.016)

small capital outlay. In proportion to the number of men in the crew, there is little difference in the profit obtained by the various types of fishing. It is reported that Tunisia now has 4 diver-operating vessels, 55 gangava boats, and over 1,000 boats using sponge hooks.

4.64 (Cross Reference: 3.238)

effectiveness of the antioxidant may sometimes be increased by the addition of 0.02-0.05 percent citric acid to complex such contaminating metals as iron and copper. The citric acid should be used with caution, however, as its reactivity with metals may bring about the introduction of more metal than it complexes.

Food-inhibitor grade n-propyl gallate (0.02-0.03%) may also be used to advantage in some applications. It must also be used with care since it often reacts with iron to form a blue-black compound that discolors the paper.

Unwaxed papers may be treated with an aqueous emulsion of an antioxidant in any of three ways: (1) the tub method, (2) the roll method, and (3) the spray method.

With the tub method the partially dried paper is passed through a tub bath located about three-fourths of the way along the drying rolls. This is the simplest method, but it can result in steam distillation of the antioxidant if too much water is applied.

In the spray method the emulsion is sprayed on the paper during the last stages of drying or dir-directly after the final drying operation. This method has the advantage of enabling treatment of both sides of the paper with a minimum application of water.

When the roll method is used the emulsion is applied to the paper by contact with the top of a wet, rotating roller that is partially submerged in an emulsion bath. A feed pipe can be used to pour a stream of the emulsion on the top side of the paper so that both sides are treated simultaneously.

In the case of waxed papers, the BHA can be dissolved directly into the molten wax before its application to the paper.

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bellies until they had gained 8 percent in weight. The resulting tissue concentration of antioxidant obtained in the various bellies was about 0.016 percent PG, or 0.039 percent HQ, or 0.039 percent HQ and 0.0016 percent CA. BHA emulsion was injected without dilution to produce a concentration of 0.039 percent BHA in the bellies.

All bacon bellies were held for 2 days at 40° F. after injection to permit diffusion of the pickle and the antioxidant. Bellies were then smoked for 18 hours at 125° F., chilled to 28° F., sliced and packaged, and divided into two lots, one of which was stored at 0° F. and the other at 28° F.

A dip method was also used for introducing the antioxidant. Cured and smoked bacon bellies from the right side of a hog were taken while still warm from smoking and dipped in a 115° -F. lard solution containing either 5, 5 percent or 10 percent BHA, whereas the cured and smoked bellies from the left side were held as controls. Both the lard-dipped and the control sides were then stored for 24 hours at 29° F. before being sliced, wrapped and stored at 0° F. and 28° F.

Of the injected antioxidants, the HQ and HQ supplemented with other antioxidants showed the best stabilizing effect (table 1, below) followed by PG and BHA in that order. HQ, PG, and CA, however, are only of passing interest. HQ is not approved as an additive for meat products.

The effect of the lard dip containing BHA is shown in table 2, below. Samples held at 0° F. kept 10-15 percent longer than samples held at 28° F. Taste panel results could not be correlated with peroxide values.

TABLE 1
Keeping quality of bacon with added antioxidants

Antioxidant used	Time to rancidity in days at 28° F.*	% by weight of bacon
Control	35	0.00
Hydroquinone	114	0.039
Hydroquinone and propyl gallate	114	0.039 and 0.016
Hydroquinone and citric acid	114	0.039 and 0.0016
Propyl gallate	85	0.016
Butylated hydroxyanisole	48	0.039

* Average values based upon duplicate treated samples and ten control samples.

TABLE 2
Effect of dipping bacon sides in lard containing butylated hydroxyanisole (BHA)

Percent BHA in lard dip	Time to rancidity in days at 28° F.	
	Test	Control (No BHA)
10.0	53	40
10.0	120	92
10.0	138	113
5.5	117	82

3.26 MECHANICALLY COOLED CARS INTRODUCE NEW ERA FOR LOW TEMP PERISHABLES

Anonymous
Refrigerating Engineering 61, No. 11, 1190-1192 (November, 1953)

With the wide spread popularity of frozen citrus juices and fruits in syrup, a need has arisen for railroad refrigerator cars capable of transporting frozen foods at -10° F. The 30 mechanical refrigerator cars recently put into service by a railway that serves the Southwest are capable of sustaining temperatures of -10° F. and lower and operating continuously for 12 days without attention. The loading space inside each of these cars is 44 x 8 1/2 x 8 feet high. Each car is equipped with a self-contained 40-h.p. diesel-electric-driven freon-12 refrigerating unit which, when operating at a -20° F. evaporator temperature and 120° -F. condensing temperature, is rated at 29,640 B.t.u. per hour. This power plant is located at the end of the car behind an insulated bulkhead in a space slightly larger than the equivalent of a normal ice bunker. Starting power for the diesel comes from a 24-volt battery hung beneath the car. This battery also powers a thermostat to cycle refrigeration between -12° F. and -6° F. in the loading space, dual pressure cut-out switches, and oil pressure safety switches.

The roof and sides of these cars are insulated with 7 inches of patented insulation. Heat transfer is provided by 550 square feet of copper evaporator surface that is swept by 4,000 c.f.m. of air at 1 1/2 inches static pressure. A steel grid floor and furring on the walls allows cold air circulation around the product in the car.

In precooling tests with an average ambient temperature of 58° F., a temperature of -12° F. was reached in 7 hours. In a road test a car loaded with frozen lima beans in California at an air temperature of -17° F. arrived in Chicago at -23° F.

 ABSTRACTER: Martin Heerdt

3.24 TRENDS AND PRACTICES IN THE REFRIGERATED STORAGE OF FOODSTUFFS IN THE COMMONWEALTH: FISH

Fidler, J. C. (Ditton Laboratory, Department of Scientific and Industrial Research)
Modern Refrigeration 56, No. 667, 374 (October, 1953)

A recent major development in the British refrigeration field has been an increase in the production of frozen fish. Herring are being frozen in increasing amounts, but the total output is still a very small percentage of the total catch because the process requires considerable labor and material. In an attempt to reduce the cost of operation, herring are now being frozen in 40-lb. packs instead of the usual 7-lb. pack. These blocks require a protective ice glaze to prevent the destructive effect of oxygen, but no use is made of antioxidants, such as ascorbic acid, gallic acid, or ethyl gallate, because of their negligible effect on the development of rancidity. Fresh herring spoil rapidly at ordinary temperatures, but because these fish are caught by drifters that do not stay at sea for very long they usually are fresh enough for freezing. In contrast, most of the white fish catch is too stale upon being landed to be fit for freezing.

Considerable thought is being given at present to fish freezing in the United Kingdom, Canada, and Australia. The present trend in all of these countries is towards improvement of the product by freezing the fish at sea as they are caught. Even the Torry Research Station is freezing white fish at sea in a recently developed plate freezer. The Australians also are freezing at sea with 10 small vessels each of which is capable of freezing and storing from 10 to 30 tons of fish per trip.

The Torry Station has discovered that quality smoked fish require a glossy colored film on the surface. This film does not form when fish that have been slow-frozen are smoked. The reason for the lack of the essential film is believed to be due to changes that occur in the proteins as a

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 ABSTRACTER: Martin Heerdt

3.33 OBSERVATIONS ON THE CANNING OF PACIFIC COAST OR DUNGENESS CRABMEAT

Farber, Lionel (Fish Research Laboratory, George Williams Hooper Foundation, University of California, San Francisco)
Food Technology 7, No. 11, 465-468 (November, 1953)

A canned crabmeat with the taste, color, and texture of freshly-cooked crabmeat can be produced if four factors are controlled. These factors are: (1) shrinkage of the meat as a result of retorting, which is associated with (2) toughening of the meat leading to a rubbery or brittle and stringy texture, (3) discoloration (blue color) that may develop in the meat after retorting, and (4) discoloration (brown color) or scorching of the white meat resulting from the use of air cooling instead of water cooling of the retored cans.

Table 2 (this card, over), reports upon an experiment that was carried out to determine the effect of cooking time of raw (butchered) crabs on shrinkage after retorting. Cooking the crab for only 6 to 8 minutes as is common practice in some areas does not appear adequate to coagulate the meat properly for subsequent retorting.

The data in table 3 (this card, over), shows the amount of fluid taken up by picked crabmeat during immersion in water and various salt solutions. Maximum drained weight after retorting will result if the crabs are cooked in water and the crabmeat is washed in 5 percent sodium chloride solution.

Since hemocyanin, the copper-containing respiratory pigment of the blood, is responsible for the blue discoloration in canned crab, removing blood from the meat will minimize discoloration. This may be accomplished on live crabs by punching a hole through the top shell just below the shield-shaped pattern near the rear end of the crab. The hole made through the shell by the sharp point of an ice pick also punctures the outlet from the heart. Placing the stuck crab on its back permits the uninjured heart

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 ABSTRACTER: Martin Heerdt

7.872 SUITABILITY OF PEROXIDE TEST AS A MEASURE OF RANCIDITY IN FATS AND OILS

Bose, S. M. and Subrahmanyan, V.
Bull. cent. Food Tech. Res. Inst. 2, 151-152 (1953)
Food Science Abstracts 25, No. 6, 679 (November, 1953)

Groundnut and coconut oils obtained by solvent extraction were stored at 20° to 34°, 47° to 50°, and 92° to 95° C., for 26 weeks; peroxide values were determined at intervals. These did not correspond to the degree of rancidity determined organoleptically; peroxide values were higher in the oils stored at the 2 lower temperatures, and rancidity was most marked at the higher temperature. Peroxides are unstable intermediate compounds, and their concentration in an oil depends on the rates at which they are formed and broken down. In these experiments they were broken down more rapidly at the higher storage temperature.

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MECHANICALLY REFRIGERATED RAILWAY CAR

CANNING DUNGENESS CRABS

STORAGE OF FROZEN FISH IN U.K.

PEROXIDE TEST FOR RANCIDITY

3.33 (Cross Reference: 1.86)

to pump the colorless to pale-blue-gray blood through the hole in the heart outlet and an appreciable amount of blood is removed during the 10 minutes that the crab continues to live. Table 4 shows the effect of bleeding live crabs on the color of the canned crabmeat.

Blue discoloration is usually minimized commercially by dipping the picked meat in a 1 percent solution of citric, lactic, acetic, or tartaric acid, which binds any copper that may be present by forming a nonionizing complex. This complex does not react readily to form the blue discoloration. According to table 5, below, citric acid causes a toughening of the crabmeat and increases shrinkage during retorting. Sodium citrate supplies the citrate ion necessary to bind copper without introducing the harmful effects of the acid. This fact is demonstrated by the data shown in table 5.

Scorch or brown discoloration can be avoided by the simple expedient of water-cooling the cans after retorting according to the data in table 6.

TABLE 2

Effect of cooking time of raw crabs on shrinkage after canning

Minutes in boiling water	Percent drained wt. of fill-in wt.
7½	72.2
8	79.7
12	87.0
15	90.7
20	87.6

½ oz., or 15 ml., of 1% sodium citrate in 5% NaCl added to each can before closing.

TABLE 3

Uptake of fluid by crabmeat during 1-3 hour immersion in sodium chloride solutions

Percent salt solution	Percent gain in weight by				
	Raw	Cooked in tap water	Cooked in 3% NaCl sol.	Steamed	
				10 min.	15 min.
0-Dist. H_2O	13.8	8.0	10.4	...	...
0-Tap H_2O	17.3	12.0	10.3	8.7	5.6
3	25.2	3.6	7.6	11.1	7.6
5	54.5	0	2.0	12.6	9.8
7	30.0	4.3	9.4	15.2	13.1
10	30.1	3.5	12.3	4.2	9.4

TABLE 4

Effect of bleeding live crabs on color of canned crabmeat

Treatment of live crabs	Blueing after canning
Crab halves cooked in water and rinsed	Definite throughout meat
Bled by puncture through shell above heart, halves washed well in tap water	Trace to none
Same, washed in 5% salt solution	Trace to none

TABLE 6

Effect of retorting process on browning of commercially canned crabmeat

Retorting procedure	Cooling of cans	Browning
145 min. at 220° F.	water	none
90 min. at 230° F.	water	none
60 min. at 240° F.	water	none
40 min. at 250° F.	water	none
35 min. at 250° F.	air	definite

TABLE 5

Effects of citric acid and sodium citrate on quality of canned crabmeat

Treatment of commercially picked crabmeat	Quality of canned crabmeat					pH after canning
	Blueing	Texture	Taste	% shrinkage		
Tap water wash	definite	fairly good	fairly good	22.5		7.0
0.5% citric acid wash	slight but evident	rubbery	not very crablike	30.0		5.9
1% citric acid wash	very slight	tough and stringy	not crab-like	33.7		5.8
Same followed by tap water rinse	slight but evident	rubbery	flat	30.0		6.1
1% sodium citrate in 5% NaCl wash	trace	good—like fresh crab	good; like fresh crab	17.3		6.7

7.872 (Cross Reference: 4.5)

3.24

result of slow freezing. Work on the relationship between the rate of freezing and the degree of loss of gloss on the fish after smoking has led to the development of the following definition: "Quick freezing" results if the temperature at the center of the fish or the food package is reduced from 32° to 23° F. (0° to -5° C.) in less than 2 hours. If the initial quality of the quick-frozen fish is to be retained for smoking after more than 3 months of storage the fish must be stored at -21° F. (-31° C.).

Freezing fish or meat causes the salts in the muscle tissue to become concentrated as the volume of the unfrozen liquid decreases. Between 27° F. (-3° C.) and 16° F. (-9° C.) these concentrated salts cause rapid denaturation of the proteins. Storage at temperatures in the range -4° to -20° F. (-20° to -30° C.) is recommended as a means of retarding protein denaturation. Low storage temperatures reduce the drying potential of the air to a minimum; however, over a long period of time a sizable quantity of moisture in the form of ice can be transferred from the fish to the cooling surfaces. This drying effect depends upon such factors as the type of cold storage construction used, the area of the cold room or rooms, the thickness of the insulation, and the area of wall exposed to wide temperature differentials. All of these factors may be brought under control in the original design of the cold storage if the expense is not of great importance. However, the more common method of guarding against drying of the fish is to protect it either with an ice glaze or a form of packaging applied to its surface.

A new interest in the old principle of jacketed cooling for the warm walls of cold storage warehouses has resulted in the use of this system in a number of recently constructed and remodeled Canadian warehouses. Heat that leaks into a cold storage warehouse equipped with jacketed walls is removed by the cold air circulating between the jacket and the insulated outer wall. The experimental cold storage plant being erected at Torry Research Station for operation in the range 14° to -40° F. (-10° to -40° C.) has been provided with jacketed cooling as well as pipe-coil, and air cooling of the rooms. The efficiency and effect of each of the 3 methods of cooling will be compared and evaluated.

1.01 FISHERY PRODUCTS IN THE WORLD FOOD SUPPLY

Jul, Mogens (Food and Agriculture Organization of the United Nations)
Food Science Abstracts 25, No. 4, 373-384 (July, 1953)

Fisheries resources are not inexhaustible. Where intensive fishing takes place, care must be taken that maximum sustained yield is obtained. In some instances, particularly involving pelagic fishes, it is difficult to determine whether the present rate of fishing has any influence on the stock. Often international cooperation is needed both in conservation measures and in research connected with this problem. New resources may also be created by fish cultural practices. Education and organization are the most urgent requirements in this respect.

Improvements in fishing methods have often led to substantial increases in fish production. Echo sounding has been of value in this. More research is needed on optimum frequencies, methods of identification of species, determination of size of fish, etc. Fishing craft have been improved. However, the rules of hydrodynamics have not received enough attention. There has been development of larger and more powerful gear of ordinary types, but until recently little attention has been paid to the study of the performance of the gear and the way it catches the fish. Such studies have led to the introduction of the floating trawl. Underwater television cameras are being used in studies of gear. Electric fishing in salt water now appears to have possibilities, but further investigation is needed.

Adequate handling, distribution and processing facilities are necessary before fish landings are increased. Forty-two percent of all fishery products are marketed fresh. Technological investigations are needed to discover practicable techniques for optimum storage and handling conditions. Codfish fillets have been kept almost twice as long by reducing the temperature of the

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 ABSTRACTER: Neva L. Karrick

2.03 PROBLEMS OF NORTHERN NORWAY

Arefjord, M.; Arnesen, E.; Eriksen, L.; Sand, G.; and Gloppestad, E.
Meldinger fra SSF, No. 5, 89-112 (September, 1953) (English summary)

Problems associated with making oil and meal in northern Norway are related with the fact that the herring of this region feed on various kinds of minute crustacea that accelerate enzymatic digestion of the herring tissue. The herring of northern Norway are usually caught during the warm summer months. These summer temperatures further accelerate enzymatic digestion. In some instances one-half of the herring protein will have gone into solution before the raw material can be processed.

Examination of the raw material

By studying the herring or "atesild" of northern Norway 5 ideas were formulated. These were: (1) Best results are obtained by holding the live herring in weirs until their stomachs become empty. (2) Time lapse from capture to processing must be minimized even if preservatives are used. (3) A mixture of formalin and sodium nitrite was found to be the best preservative. (4) A dispensing device is necessary to insure the use of exact amounts of the preservative. S.S.F. has developed a model of a dispensing device. (5) Mechanical handling of the herring must be reduced to a minimum.

Herring examined immediately after capture contained 20 percent water-soluble constituents. Herring from the same lot contained 30 percent water-soluble constituents upon reaching the factory. Even the addition of small amounts of preservative did not retard this autolytic breakdown. Blood-water drainage during storage also may result in the loss of as much as 6 percent fat and 11 percent non-fat solids.

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 ABSTRACTER: Martin Heerdt

3.4 THE DRESSING, CURING, AND SMOKING OF SALMON

Dewberry, Elliot B.
Food Manufacture 28, No. 11, 425-427 (November, 1953)

In the United Kingdom only salmon weighing at least 12 pounds and received in a fresh condition will yield a first-class smoke-cured product. After they have been washed, the head and fins are removed; the body is split, eviscerated, and cleaned; and the backbone is removed. A final washing with water is necessary to remove all traces of blood, viscera, gills, and membranes. The dressed salmon are then split to yield two sides, each of which is lightly scored with a knife to facilitate more thorough salting. The scored sides are packed in coarse fishery salt for 16 to 48 hours, depending upon their size, then thoroughly washed and hung up to dry in the open air or in a drying room until they lose about 10 percent of their fresh weight.

For cold-smoking, the sides are hung over a smoldering oak or birch sawdust fire on wooden sticks or tenters equipped with hooks or threaded through the napes onto pointed metal rods or speats. The temperature of the smoke and warm air used in smoking never exceeds 85° F. during the 24 to 36 hours of the process. Smoked salmon if stored at 36° F. will keep for about 10 days.

To produce Scotch mild-cured salmon the split fish is placed skin down and rubbed with a mixture of equal amounts of coarse fishery salt and brown sugar. About 48 hours after applying the cure the salmon is hung to dry either in the open air or in a kiln. This salmon is smoked in the kiln for only a few hours. The result is a temporary mild-cure with the keeping qualities of kippered herring.

To produce Norwegian mild-cure, split salmon are held in salt pickle for three days, after which they are washed and drained. After being stretched across 2 or 3 sharpened pieces of lath, the salmon

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 ABSTRACTER: Martin Heerdt

3.33 CANNING FISH CHOWDER

Anonymous
Food Engineering 25, No. 11, 186 (November, 1953)

The two steps usually involved in the manufacture of fish chowders are (1) making the broth and (2) using this broth together with the other ingredients in making the chowder. The broth is made in a steam-jacketed kettle by simmering 1,000 pounds of fish heads and trimmings in about 500 gallons of water for 2-2 1/2 hours. This broth is then drawn off into a holding tank.

The other ingredients, which consist of onions, pork, flour, water, cod or haddock, potatoes, and salt, may be prepared as follows: A 13 1/2-pound quantity of diced onions is cooked until soft, then 14 pounds of diced pork is added to the onions, and these two ingredients are cooked together until the pork is soft. Meanwhile, 19 pounds of flour and 12 gallons of water are combined with the aid of a mechanical mixer to make a slurry. The slurry is added to the cooked onions and pork along with 15 gallons of the fish broth, and the mixture is brought to a boil.

A second 15-gallon quantity of broth is added to the mixture and it is again brought to a boil. Then a second flour and water blend made from 18 pounds of flour and 7 1/2 gallons of water is added and the batch is brought to 60 gallons in volume by the addition of more broth. Finally, 12 pounds of salt is added, and the mixture is brought to a boil for the third time.

Number 1, picnic-size cans are suggested for use in packing the chowder. Fresh cod or haddock (2 oz.), blanched diced potatoes (2 oz.), and citric acid (1 g.) to prevent discoloration are added to each No. 1 picnic-size can. Then the cooked onion, pork, flour, water, salt, and broth mixture is added until the can has been filled to the headspace mark. The cans are hermetically sealed, processed at 240° F. for 75 minutes, and water-cooled.

 ABSTRACTER: Martin Heerdt

FISH IN THE WORLD FOOD SUPPLY

CURING AND SMOKING OF SALMON

AUTOLYSIS IN NORWEGIAN HERRING

CANNING FISH CHOWDER

3.4 (Cross Reference: 1.30)

are "tentered", hung in a chimney, and exposed to smoke from a fire of fir branches for 1 1/2 to 2 days.

Norwegian hard-cure is produced in a somewhat different manner. The salmon sides are rubbed with the salt and sugar mixture and packed layer upon layer in a cask with a quantity of the mixture between each layer. The cask is then filled with a fresh saturated salt solution, headed, and laid on its side. The cask must be kept full of saturated salt solution at all times. Salmon packed in this way should keep for 2 or 3 months. After washing, draining, and drying, these hard-cured salmon are smoked in the same way as the mild-cured salmon.

In the U.S.A., salmon for smoke-curing are scored longitudinally with a knife to facilitate salting. They are then split into sides and cleansed of all viscera and blood. Each side is rubbed with a mixture consisting of fishery salt 6 lb., brown sugar 4 lb., saltpeter 1 oz., ground bay leaves 1/2 oz., ground black peppers 1/2 oz., ground cloves 1/2 oz., ground coriander seeds 1/2 oz., and ground allspice 1/2 oz. After they have been rubbed, the sides are packed layer upon layer in a barrel or tub with a quantity of the mixture between each layer and allowed to remain for 48 hours.

Before smoking, the salmon sides are soaked for 1 hour in fresh, cold water, pressed to remove excess water, and suspended on smoke sticks in the air until a thin dry skin forms on the surface. The dry sides are then hung in the smokehouse and smoked 16 to 24 hours over a low fire of beech or hardwood chips and an additional 8 hours over a fire that produces a dense smoke. Smoke temperatures do not exceed 80° F. at any time. These sides will keep for 10 to 14 days at 70° F.

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flesh from +1° to -0.5° C. The addition of preservatives to fresh fish have included studies on nitrite, hydroxylamine, and some antibiotics. Both X-ray and cathode-ray types of equipment were used for experimental sterilization of fresh fishery products. Complete sterilization was obtained and nutritive values were retained, but enzymes were not affected. This meant undesirable biochemical changes still occurred.

Studies of biochemical and biophysical changes in frozen fish are being conducted. A freezing technique capable of handling fish in bulk is being developed.

More fish flesh might be available by utilization of the flesh that is discarded during filleting or other preparations. This might be used for soups, fish flour, or in the manufacture of hydrolyzates as egg white substitutes. Better use might be made of scraps and other waste products. The direct use of algae and plankton would be more efficient than utilization of the fish. Fats were experimentally produced in Germany from fresh-water algae but the process was not economical. Basic studies are being carried out on the artificial growth of plankton in fresh and salt water and the direct harvest of naturally growing plankton.

A number of international commissions already exist to co-ordinate fisheries research work. The FAO has encouraged cooperation through its Fisheries Division and establishing of councils in various areas of the world. The FAO has also assisted countries, especially with under-developed fisheries to improve administration, research and techniques of operation.

2.03 (Cross References: 1.2, 6.130)

An improved method for "atesild" reduction

The large quantity of soluble solids encountered in "atesild" reduces the meal yield. "Atesild" herring after being cooked may contain as much as 700 liters of liquid instead of the normal 350-400 liters of liquid per sack of meal. Pressing is made difficult by the loss of press efficiency and the presence of an excessive amount of sludge. Coarse sieving followed by continuous sludge separation in a superdecanter is recommended for the removal of excess liquid and sludge. About 800 kg. of wet sludge per hour or 300 kg. of dry solids per hour could be removed by this method.

In experiments carried out at Oksfjord the entire mass of cooked herring was put through a superdecanter. The presses could be eliminated entirely by this procedure, but the maximum recovery of solids did not exceed 300 kg. of meal per hour. Centrifuging made possible the manufacture of salable meal from raw material that could not be handled by the usual methods.

Cooking "atesild" in a fuel gas cooker

Raw material that could be processed only with great difficulty in a direct steam cooker was made easily pressible in an indirect-fired fuel gas cooker. The indirect-fired cooker will not accommodate as much "atesild" as winter herring, but heat transfer is better and hence capacity is greater with the "atesild" than with the winter herring. "Atesild" can be dried at the rate of 100 liters per hour per square meter of heat exchange surface in an indirect-fired cooker.

6.133 LECTURES OF THE 1953 SHORT COURSE ON ENGINEERING ASPECTS OF PROCESSING EDIBLE OILS

Symposium
Journal of the American Oil Chemists' Society 30, No. 11, 473-582 (November, 1953)

The following is a list of the lectures given at the 1953 short course on the Engineering Aspects of Processing Edible Oils. The course was sponsored by the American Oil Chemists' Society and conducted by The Institute of Oil Seed Technology, Agricultural and Mechanical College of Texas at College Station, Texas.

Foreword	Lindsay, J. D. and Thomson, Procter
General Discussion of Processing Edible Oil Seeds and Edible Oils	Fincher, H. D.
Some Factors Affecting the Hydraulic Extraction of Cottonseed Oil	Hickox, G. H.
History of and Latest Developments in Expeller and Screw Press Operations on Cottonseed	Dunning, J. W.
Vegetable Oil Refining Procedures	Thurman, B. H. and Mattikow, Morris
Liquid-liquid Extraction	Pratt, Thomas W.
Hydrogenation of Fatty Oils	Hughes, J. P.

7.51 STUDIES ON THE PROTEINS OF FISH SKELETAL MUSCLE. 2. ELECTROPHORETIC ANALYSIS OF LOW IONIC STRENGTH EXTRACTS OF SEVERAL SPECIES OF FISH

Connell, J. J. (Torry Research Station, Aberdeen)
Biochemical Journal 55, No. 3, 378-388 (October, 1953)

The twenty species of fish involved in this study were cod (and codling), haddock, whiting, coalfish, ling, hake, herring, angler, plaice, lemon sole, witch, megrim, turbot, common skate, thornback skate, cuckoo ray, lesser-spotted dogfish, pike, perch, and common carp. The muscle extracts of these fish were examined electrophoretically at 0.05 ionic strength and pH 7.5. Data on mobility determination and percentage composition appear in tables 1 and 2, omitted. A characteristic electrophoretic diagram was found for each species, and considerable differences in mobility and composition were found to exist between species. The diagrams fall into definite mobility groups of approximately consistent quantitative size in spite of the differences in mobility. Both related and unrelated species of fish have dissimilar diagrams.

Elasmobranch muscle apparently contains proteins with unusually high isoelectric points.

Components that are present in some species are entirely absent in other species.

 ABSTRACTER: Martin Heerdt

7.593 EFFECT OF SOLUTE CONCENTRATION ON COUNTERCURRENT DISTRIBUTION OF PHOSPHOLIPINS

Olley, J.
Biochim. Biophys. Acta 10, 493-498 (1953)
Food Science Abstracts 25, No. 6, 647 (November, 1953)

Countercurrent distribution of the crude phosphatides obtained from an acetone extract of haddock muscle, between light petroleum and acetone-ethanol, was shown to vary greatly with the concentration of the extract. Increasing concentration of the phospholipin extract favored distribution into the petroleum phase. This effect was found to apply also to the countercurrent distribution of phospholipins from groundnut and soya bean between light petroleum and 85% ethanol. Countercurrent distribution of the phospholipins of haddock muscle at high concentrations was found to be advantageous for the separation of some constituents of the mixture, notably the separation of the plasmal-containing phosphatides from the choline-containing phosphatides.

 Reprinted in whole

6.54 EGG WHITE AND YOLK SUBSTITUTES: WIKING EIWEISS

Shenstone, F. S.
Food Preservation Quarterly 13, No. 3, 45-50 (September, 1953)

The search for egg white and yolk substitutes has been stimulated in recent years by shortages, the high price of eggs, and by the desire to find outlets for surplus byproducts. One of the egg white substitutes discussed by the author is a product called Wiking Eiweiss, a soluble albumen made from fish.

Good quality fillets of white fish are required for the production of this product. Fresh codfish is generally used, but through the war air-dried cod was the main source. The fresh fish is skinned, filleted, and uniformly shredded and the pieces are leached with 0.5 percent acetic acid at 80° C. for 30 to 60 minutes. The soluble nitrogenous constituents are thus removed, the connective tissue is broken down and the ash content is possibly removed. The material is then washed in running water in a drum sieve before it is placed in a press to reduce the water content to 40 percent.

The oils and fat are extracted from the presscake for 1 to 5 hours with 95 percent alcohol. Unless the final fat content is below 0.1 percent the Wiking Eiweiss develops off-flavors and rancidity due to fatty acids liberated in the final alkali treatment. Excess solvent is completely removed in a vacuum dryer at 70° C.

The dried material is ground to a fine powder and then made soluble by hydrolyzing with aqueous alkali. Caustic soda (5-6 percent of the weight of the fish protein) and water (6 gallons to 10 pounds of protein) are milled with the powder for about 2 hours at 80° C. in a roller mixer. The solution is neutralized with acetic acid and then spray-dried. An inlet air temperature of 130°C. and an outlet

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 ABSTRACTER: Roy C. Stevens

PROCESSING EDIBLE OILS

ANALYSIS OF PHOSPHOLIPINS

ELECTROPHORETIC ANALYSIS OF FISH MUSCLE

EGG WHITE SUBSTITUTE FROM FISH

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air temperature of 60° C. are used.

The final product is a slightly gray, odorless, tasteless and easily digestible powder having a high protein content. Its ash content may be as high as 20 percent since sodium acetate is formed in the neutralization. It is claimed that a 7 percent solution will whip into a foam equivalent to natural egg white, which contains 12.5 percent solid. The product is not coagulated by heat and cannot be "overbeaten."

Wiking Eiweiss may be used in aerated bakery goods, sugar confectionery, ice cream, mayonnaise, custard powder, pharmaceuticals; and in the textile and leather industries.

6.133

Deodorization	White, F. B.
The Plasticizing of Edible Fats	Joyner, N. T.
The Basket Extractor--The Universal Extractor	Hutchins, R. P.
Mechanics of Solvent Extraction with the Immersion Type of Extractor	Moore, N. Hunt
Statistical Methods and Quality Control	Thomson, Procter
Basic Theory of Automatic Control	Bowden, C. W. Jr.
Economics of Cottonseed Extraction	Becker, K. W. and McCubbin, Keator
Heat Transfer	Hayward, J. W.
Accident Prevention in Cottonseed Oil Mills	Free, E. B.
Present Practices in Industrial Water Conditioning	Thorngren, Bert I.
Materials-Handling at Oil Mills	Vercoe, C. S.
Corrosion and Plant Maintenance	Rench, Joe
Filtration in the Oils and Fats Industry	Rayshich, Alex
Pumps, Their Selection and Installation	Harris, W. D.

3.12 SUMMARY OF RESEARCH ON PRESERVATION

Anonymous
Meldinger fra SSF, No. 7, 142-158 (November, 1953)

Over a period of several years, the Herring Oil and Herring Meal Research Institute and the laboratory of the Norwegian Fisheries Research Institute have been engaged in research with a view to arriving at new and better methods for the preservation of herring raw material for meal and oil production. The interest in such methods has been stimulated by the new processes for glue water utilization now having been developed. After having examined a long series of possible preservatives, formalin and sodium nitrite were found to be the most promising.

Systematic tests have been carried out to examine their preserving properties and the influence of all factors in connection with their use. The determination of the biological effect of meals elaborated from raw material preserved with nitrite has been the object of a joint program in which the two research organizations mentioned, together with the Universities of Agriculture and Veterinary Science have been involved. Safe limits for residual nitrite in herring meal have been established. Details regarding these results will appear in a joint report shortly.

The present article deals with the chemical and technological aspects of the question. Formalin and nitrite both "disappear" during the manufacturing process. Formalin is practically "exhausted" after a short storage period. With regard to nitrite, the method of elaboration is of importance, but in any case the amounts chosen for preservation must be such that only little is left after the storage period. Tables are given showing the preserving action of nitrite, formalin and mixtures of the two under varying conditions of storage. Tables are also given showing the decomposition of nitrite in the herring as a function of storage time and temperature. During the cooking process little

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Reprinted in part

2.06 NEW CANNED, PREPARED SALMON PRODUCT

Anonymous
Pacific Fisherman 51, No. 13, 58 (December, 1953)

A new ready-to-serve, hot-or-cold seafood product has recently been introduced to the American market. It is a carefully proportioned combination of skinless salmon, divided into bite-size portions; uniform, short lengths of cooked macaroni; green peas; vegetable oil; salt, and monosodium glutamate.

The texture of the product is said to be firm; the contents of the can will stand without collapsing, yet the ingredients will separate readily with a fork. The product is packed in No. 300 cans with a net weight of 15 ounces.

Recipe panels on the label recommend serving the item hot as a casserole or fried in croquettes, or chilled with vegetables as a seafood and vegetable salad. However, it is probable that the product will be served most frequently with no more preparation than mere heating in a sauce pan. It is said to heat without sticking and without cooking to pieces.

In developing this product the company is capitalizing on the modern trend toward providing foods that are fully prepared, quick, easy and convenient, and which at the same time provide a well-balanced, attractive, tasty, and nutritious meal.

COMMERCIAL FISHERIES ABSTRACTS VOL. VII NO. 2 PAGE 15
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE.

ABSTRACTER: Roy C. Stevens

3.231 JET-FREEZING, NEWEST QUICK-FREEZE SYSTEM

Simons, Edward
Food Engineering 25, No. 11, 57-61, 136-140 (November, 1953)

Jet-freezing is a new method of air-blast freezing that can be used to increase the capacity of existing freezer space with a minimum of expense. This method has been applied successfully to the freezing of poultry in a Texas cold-storage warehouse.

Only two basic additions to the freezer space are necessary to convert to jet-freezing. These are: (1) the installation of additional evaporator coil surface to increase the freezer capacity of the space and (2) the installation of an overhead jet duct 3 x 3 x 20 feet in length, constructed from 5/16-inch fir plywood, and equipped with a 7 1/2-h.p. axial-flow fan. The jet duct, which does not contain any refrigerated coil surface, simply gathers room air with its axial-flow fan and directs this air at a velocity of about 4,000 feet per minute into the center space between two palletized rows of boxed poultry to be frozen (figure 1, this card, over). In traveling downward into the space between the two palletized rows of boxed poultry, the high velocity air from the duct discharge picks up or entrains an additional quantity of air equal to 1 1/2 times its original volume. The total quantity of air funneled into this closed space is sufficient to insure that the minimum air velocity through the pile of boxes is not less than 150 feet per minute at any point.

The four jet ducts with fans now in operation in a Dallas, Texas plant are freezing 200,000 pounds of turkeys every 24 hours in a room 110 feet by 195 feet in size. This room is equipped with 36 2-ton ceiling-blower-type heat-exchangers. The nozzle outlets of the jets are set 13 feet, 10 1/2 inches vertically above the floor of the freezer room. The distance from the jet outlets to the top of the pile of boxes is 3 feet, 11 inches. The width of the enclosed pressure pocket is 14 to 16 inches. Each

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COMMERCIAL FISHERIES ABSTRACTS VOL. VII NO. 2 PAGE 15
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE.

ABSTRACTER: Martin Heerdt

3.5 NEW METHOD OF CURING SALT CODFISH

Anonymous
Canadian Fisherman 34, No. 11, 32 (November 1953)

A new method of curing salt codfish known as the "mechanical flake" is in operation at a Newfoundland plant. Instead of the conventional drying racks made of "longers and boughs", the new process requires well-built and sturdy wooden racks. These are made to fit wire trays on which the fish is spread. The trays are pulled into position and removed by means of a cable and winch.

This method of spreading the fish enables a crew of 14 men to handle 50,000 pounds in less than one hour. The same number of men spreading fish by hand would take many more hours to handle the same quantity.

The "mechanical flake" is the idea of the company's president and the construction is being financed by the Canadian Department of Fisheries on an experimental basis.

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ABSTRACTER: Roy C. Stevens

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pallet load of turkeys to be frozen is two wooden boxes wide and five boxes high. Each box is 22 3/4 inches x 32 inches x 8 inches wide.

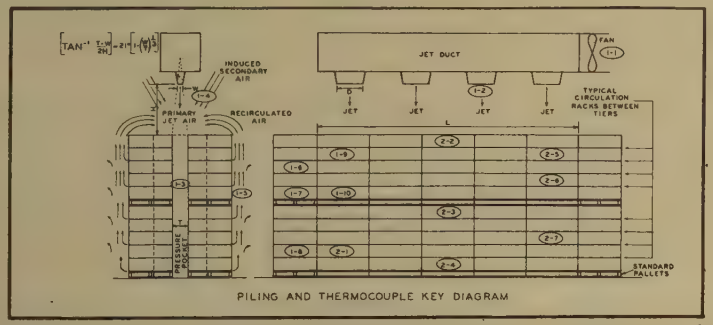

FIG. 1. Piling principles and jet relationships used. Boxed turkeys—5 boxes per pallet, two pallets high—form the pile. Boxes are separated by air-circulation racks. Jet duct is located directly above central chimney. Numbers, in ovals, indicate locations of thermocouples during test.

3.5 (Cross Reference: 1.5)

3.12 (Cross Reference: 1.2)

decomposition takes place. During the subsequent drying operation, in round figures, about one-half of the nitrite "disappears", fairly independent of temperature and dryness of finished meal. During the storage of the meal, the nitrite content diminishes slowly so that it is possible to obtain meal with a very low nitrite content even if the amounts of preservative initially used have been excessively high. But this may require a very long storage period.

The article finishes by giving some tentative practical rules for the preservation of winter herring.

2.06 (Cross Reference: 1.30)

2.12 SOUTHEASTERN ALASKA EXPLORATORY HERRING FISHING OPERATIONS, WINTER 1952/53

Kolloen, Lawrence N. and Smith, Keith A. (U. S. Fish and Wildlife Service, Seattle, Washington)
Commercial Fisheries Review 15, No. 11, 1-24 (November, 1953)

Explorations to determine the feasibility of winter herring fishing in Southeastern Alaska were conducted in the winter of 1952/53. Under a cooperative program between the U. S. Fish and Wildlife Service and the Alaska herring industry, the exploratory fishing vessel John N. Cobb explored the waters of Southeastern Alaska between November 4 and December 19, 1952. An amendment to the Alaska fishery regulations permitted the operation of four commercial herring seiners in the waters south of 55° N. latitude between November 9, 1952 and February 11, 1953.

The John N. Cobb did not find herring on the grounds customarily exploited by the summer fishery. Although indications of herring were obtained in Port Camden, Seymour Canal, George Inlet, Silver Bay, Tongass Narrows, and Kendrick Bay, only in the latter three localities were there indications of abundance. The catch of the commercial seiners was approximately 30,000 barrels, 68 percent of which came from Kendrick Bay. Catches were also made in McLean Arm, Foggy Bay, Nakat Bay, Boca de Quadra, and Yes Bay. The most significant concentration of herring was in Tongass Narrows, which was closed by regulation to fishing for reduction purposes.

Herring from Kendrick Bay (which provided the bulk of the catch) were small. Fairly large herring were obtained from the localities of Foggy Bay, Nakat Bay, and Boca de Quadra. The Tongass Narrows herring were of mixed size, averaging much larger than those of Kendrick Bay, but not equal in size to those of Nakat Bay.

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 ABSTRACTER: Keith A. Smith

2.116 RADAR FOR FISHING VESSELS

Anonymous
Canadian Fisherman 40, No. 11, 36 (November, 1953)

A new model radar has recently been developed that is expected to find widespread use on fishing vessels. While it has all the essential features of its bigger predecessor, the new unit is small, compact, simple to operate, and of relatively low cost. With it, a captain can guide his vessel through a crowded harbor in heavy fog or darkness without fear of colliding with other vessels or objects.

The unit operates on the standard radar principle, sending out radio signals like the rays of a searchlight. "Echoes" rebounding from objects in the path of the rays are picked up by the radar, which translates the time interval between the signal and its echo into distance. The direction and distance of objects are indicated on a picture scope, similar to a television screen.

The new model is described as a pulse radar with a 10-inch scope. It has selective ranges of one, two, four, eight, and sixteen miles. There are two units, consisting of the antenna-transmitter, which is mounted on the mast, and the indicator-receiver unit, which can be mounted on the bulkhead, overhead, or placed on a table or shelf. A bearing cursor and a "reflection plotter" enable the operator to keep a constant check on the ranges, bearings, and courses of other vessels, to avoid collisions; or to keep similar track of fixed objects like buoys, shore points, and lightships for navigational purposes.

 ABSTRACTER: Roy C. Stevens

2.115 THE TROLLING BOAT AND ITS OPERATIONS ON THE PACIFIC COAST

Hanson, H. C.
World Fishing 2, No. 11, 429 (November, 1953)

The following is the author's summary of a paper presented at the FAO-sponsored World Fishing Boat Congress, Paris, France and Miami, Florida, October, 1953.

Trolling boats are the most numerous type of fishing vessel used on the Pacific coast; they range in size from small rowing boats and outboard and inboard powered types for sport fishing to the large commercial craft of up to 60 ft. or so. It is the latter type that is the main subject of this paper.

Whereas the original trollers were double ended, a derivation from the early gill net boats, the stern design was changed to the seine or square stern so that the vessels could be used for other purposes than trolling.

The majority of these craft are built in the bent oak frame type construction, some with floors, which is the descendant of the east coast type, but most with the west coast type keelson construction, a natural tendency since the material in long lengths is more easily available.

The first designs of these fishing craft were all comparatively narrow, but present-day boats are as much as 25 percent wider with about the same increase in depth, caused by the increased powers now available and the knowledge that greater speed is attained by greater waterline width.

Some of these vessels go as much as 100 miles off shore and up to 1,000 miles away from their home port, so adequate tankage has to be provided. Practically none carry mechnical refrigeration as

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 Author's summary

2.115 DESIGN AND CONSTRUCTION OF BRITISH COLUMBIA FISHING VESSELS

Allan, Robert F. (Naval Architect, Vancouver, B. C.)
Western Fisheries 47, No. 2, 12-19 (November, 1953)

The article is a reproduction of the paper presented by the author at the FAO-sponsored World Fishing Boat Congress in Miami, Florida.

The fishing vessels of British Columbia may be divided into two general classes: (1) those under 15 tons gross which are largely owned or operated by individuals or partners; and (2) those over 15 tons gross, most of which are owned by companies or individuals employing crews on a share basis.

The materials most commonly used in fishing vessel construction are Douglas fir, red cedar, yellow cedar, Australian gumwood or ironbark, and white oak. The properties and special uses of each are discussed. Yellow cedar is considered of special value in boat building because of its low density, its ease of working and handling and its excellent resistance to rot. Fir plywood is used quite extensively for sheathing of deckhouses inside and out and for other applications where it serves to maintain watertightness and at the same time provides an attractive finish.

The bent-frame type of construction is used by most British Columbia boat builders. It is more simple than that for a sawn frame and is conseuqently somewhat more economical. Other principles of general construction and design are also discussed.

Fishing vessels under 15 gross tons are mainly of the following types: gillnetters, trollers, long-liners, and small table or drum seiners. Those of the larger class are: halibut long-liners, salmon seiners, herring seiners, packers, and draggers. There is now a trend toward combining

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 ABSTRACTER: Roy C. Stevens

ALASKA EXPLORATORY HERRING FISHING

PACIFIC COAST TROLLING VESSELS

RADAR FOR FISHING VESSELS

DESIGN OF B. C. FISHING VESSELS

2.115

cool temperatures in the salmon fishing regions make ice refrigeration adequate. Since these vessels are in heavy weather a great deal, steadying sails, or, in some cases a mechanical stabilizer, are part of the equipment.

In recent years a number of welded steel vessels have been built for this service but, although they have proved satisfactory, fishermen have not been very enthusiastic about them due, it is believed, to the warmth of the older type wooden craft and to an inherent prejudice against them.

Design and constructional details are given of a typical Northwest trolling vessel, and here the author expands on all the special features of the craft which result from fishermen's requirements.

2.115

types in order to enable vessel owners to engage in more than one type of operation.

Cut-away and profile drawnings of different types of vessels are presented. The British Columbia gillnetters are distinctly different from the Columbia River and Bristol Bay boats in that they handle the net by means of a power drum over the stern, whereas the former pull theirs in by hand over a power gurdy set either in the forward or after gunwale.

The trend in troller construction has been toward larger sizes and greater beam up to the limit of 15 tons gross to permit the vessel to be used for long-lining or seining as well as trolling. Draft versus stability is discussed.

Long-line boats of less than 15 tons are invariably built to the maximum dimensions possible within the tonnage limit, usually about 42 feet long and 12 feet abeam. The Norwegian-type stern is generally modified in these vessels to give a fuller deck line. These vessels too, have been influenced by the seine-boat types.

A recent trend in small seiner construction has been toward the use of a drum to handle the seine in a manner similar to that used by gillnetters. The principal advantage of this type of fishing is that the number of men required is cut to 4 or even 3.

The design of salmon seiners over 15 tons, salmon-herring seiners, fish packers, and draggers is also discussed.

2.12 (Cross Reference: 1.2)

Herring in their second year of life were predominant in the catch from Kendrick Bay. The Foggy Bay, Nakat Bay, and Boca de Quadra catches showed a greater spread of ages with a predominance of 3-year and 6-year fish. The Tongass Narrows fish were of mixed age, ranging from 1 to 6 years.

Laboratory analysis showed the winter herring to be approximately 13 1/2 percent oil by weight. The oil yield of slightly less than 3 gallons per barrel of raw fish processed, which was obtained in the commercial operations, was less than the 5 gallons normally obtained in the summer operations. No increase in oil content was noted with increased age, as has been the experience in the summer catch.

It was observed that in winter the herring tend to stay at much greater depths than in the summer period, which suggests that the use of deeper nets, such as employed in the Canadian fishery, may be necessary for successful winter fishing.

A total of 5,397 herring were tagged with internal belly tags to determine if there is a southward migration of Southeastern Alaska herring into British Columbia. However, the British Columbia fishery did not operate in the season of 1952/53, so that chances for recovery in that area have been lost for this season.

Where herring were found, they were abundant, as shown by the high average catch per set of the commercial boats. Had the herring in Tongass Narrows been available to the fishery, the commercial operations would have been more successful. Tongass Narrows appears to be comparable to Ogden Channel in northern British Columbia as an assembly area of the prespawning schools. The Ogden Channel area contributed 480,000 barrels to the British Columbia herring catch in 1951/52.

0.118 DEVELOPMENT OF BUCKEYE MOISTURE METER FOR USE ON OIL-BEARING MATERIALS

Ledbetter, D. M.; Wissel, H. J.; and Maskey, D. F. (Buckeye Cotton Oil Company, Cincinnati, Ohio)
Journal of the American Oil Chemists' Society 30, No. 11, 442-447 (November, 1953)

Moisture is an important variable in the storage and processing of oil seeds and related materials for the following reasons: (1) Seed receipts high in moisture usually require drying prior to storage if losses in quality are to be avoided; (2) the moisture content of the prepared meats has a direct influence upon oil extraction efficiency; and (3) the moisture content of a finished meal must be held at an established uniform level if product quality is to be maintained.

To design a moisture meter, it was necessary to establish some characteristic of the material to be analyzed that varies with the moisture content and can be measured with a consistent degree of accuracy. The 4 possible measurements that appeared to satisfy these requirements were: (a) dielectric constant of the materials, (b) d. c. resistance of the materials, (c) loss in weight of a sample after drying, and (d) relative humidity of a gas surrounding a sample at the moisture equilibrium point. Preliminary work done in 1929 and rechecked in 1933 indicated that the measurement of the dielectric constant was more reliable than the measurement of d. c. resistance. From then on the entire efforts were concentrated on the dielectric-type meter.

The meter is simple in operation. After an initial warm-up period which is common to all vacuum-tube circuits, the following procedure is followed: (1) The meter is zeroed with a clean, dry, empty sample tube in the test cell; (2) the tube, after being removed from the cell, is filled with a sample, tapped gently three times on a rubber mat, and returned to the cell; (3) the meter deflection is read and recorded; (4) the tube is removed from the cell and the temperature of the sample is taken

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 ABSTRACTER: Martin Heerdt

1.0111 ANNUAL REPORT OF THE FISHERIES RESEARCH BOARD OF CANADA, 1952

Reed, G. B. and Dymond, J. R.
Annual Report of the Fisheries Research Board of Canada for the Year 1952, 231 pp.

The Fisheries Research Board of Canada operates as the scientific research branch of the Department of Fisheries. Work carried on by the Board is organized in three closely co-ordinated fields.

Biological stations are maintained at St. John's, Newfoundland; St. Andrews, New Brunswick; Winnipeg, Manitoba; and Nanaimo, British Columbia. The work carried on in the field of fishery biology during the year is discussed in the reports of the individual stations.

Work on oceanography is conducted out of the biological stations on both coasts. A special section is devoted to a report of this work.

Experimental or technological stations are maintained at Halifax, Nova Scotia; Grand River, Quebec; and Vancouver, British Columbia. These laboratories are concerned with problems of preservation of seafoods and with the recovery of byproducts.

The research conducted at the Atlantic Fisheries Experimental Station is presented under the headings of fresh fish, frozen fish, salt fish, nutrition studies, marine oils, and technical services. The report covers 36 pages.

(over)

 ABSTRACTER: Roy C. Stevens

2.115 COMBINATION FISHING VESSEL OF THE PACIFIC

Hanson, H. C.
World Fishing 2, No. 11, 430 (November, 1953)

The following is the author's summary of a paper presented at the FAO-sponsored World Fishing Boat Congress, Paris, France and Miami, Florida, October, 1953.

This paper, covering the design and construction of the typical combination vessel or all-purpose craft, has been prepared with the intention of showing how the boat is arranged to purse seine for salmon, herring, etc., drag for bottom fish, long line for halibut, fish for tuna and troll for salmon.

The author feels that, as these craft have proved so valuable in the North Pacific, this type is the best for world-wide fisheries use because of that versatility. Present costs are so high that the construction of a single-purpose craft is in most cases wasteful and points to yet another advantage of the combination vessel, which can be usefully employed throughout most of the year.

Three variants of combination vessel are described here: type 1, 50-79 ft. in length in bent oak frame and welded steel suitable for seining, dragging, long lining for halibut, trolling and bait fishing for tuna; type 2, 80-125 ft. in length in sawn frame construction suitable for purse seining, dragging, long lining, and bait fishing for tuna; and type 3, 80-100 ft. in length of welded steel construction suitable for ocean work, including purse seining, dragging, long lining and bait fishing for tuna.

Each of these three types is then described in detail as regards design and construction with special attention to their requirements and the selection and installation of equipment and fishing gear.

 Author's summary

2.1128 HOW TO REDUCE LOBSTER TRAP BORER DAMAGE

Dow, Robert L. and Baird, Frederick T., Jr.
Atlantic Fisherman 34, No. 10, 16-17 (November, 1953)

Borer damage to wooden lobster traps has almost reached epidemic proportions in some areas of the coast of Maine. Various preservatives have been tested by the Maine Department of Sea and Shore Fisheries in an effort to reduce this damage.

Experiments were conducted in which traps were treated with a number of different chemicals and preservatives, including Gymseal, tar, Koppers preservative, aniline dye, shellac, copper paint, creosote and pitch, Intertox, chromated zinc chloride, Cuprinol, creosote dip and pressure impregnated creosote. Traps so treated were fished from August 1950 to September 1951. The cost of these treatments varied from 45 cents to 75 cents per trap. The time involved depended on the treatment, but averaged between 30 and 45 minutes per trap with either spray or brush.

During the experimental period, 6,859 lobsters were caught by the three commercial fishermen using the treated traps. A total of 43.1 percent of these lobsters were taken in the treated traps, while 56.9 percent were taken in corresponding untreated controls. To provide a reliable index of catchability, each treated trap and untreated trap were fished in pairs. All traps were uniform in design, material, condition, and construction.

The following conclusions were reached:

" 1. Borer incidence is at least nine times greater in untreated traps than in those that have been treated.

(over)

 ABSTRACTER: Roy C. Stevens

2.1128 (Cross Reference: 2.113)

2. The life of any trap will be increased greatly by treatment to prevent borer damage. However, where high losses of traps from storms and other conditions occur, these causes may outweigh the benefits of treatment.

3. Any treatment used seems effective.

4. Treatments applied by brush should be renewed periodically; probably once a year at least.

5. The average cost of treatment is 60¢. The average time consumed in treatment is 35 minutes.

6. Creosote base preservatives definitely appear to reduce the catchability of the trap.

7. No treated trap was as fishable as untreated traps.

8. Borer control can be effected to a considerable extent by rotating untreated traps. If untreated traps are removed from the water for a three-day period each month, any borers therein will be destroyed."

0.118

with a rapid response thermometer and recorded; and (5) the moisture content of the sample is read from a graph or tables based upon the temperature of the sample (figures 4 and 5).

The Buckeye Meter has been used with success for determining the moisture content of whole soybeans, cracked soybeans, soybean meal, cottonseed, cottonseed meats, cottonseed meal, sesame seed, sesame meal, and copra meal. In actual use the accuracy of the meter may be in the range ±0.25 percent which approximates the standard deviation of a single moisture determination run for 1 hour in an oven. The amount of deviation depends upon the technique of the operator, the accuracy used in obtaining the temperature, the uniformity of the fill and packing of the sample, and the cleanliness of the sample tube. The accuracy of the determinations can be improved with care in operation and by using an average of three meter readings per sample.

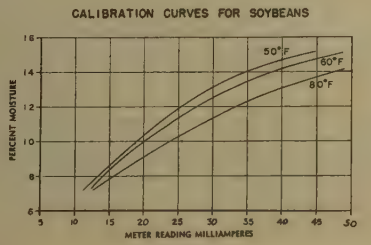

Fig. 4

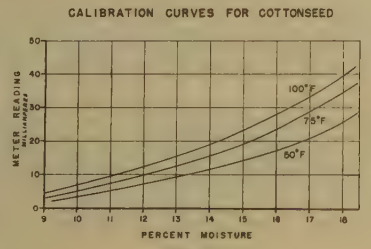

Fig. 5

1.0111 (Cross References: 0.6, 9.6)

The Gaspé Station at Grand River concerned itself mainly with the problems of salt fish and marine oils. The salt fish investigation consists of basic studies in chemistry, bacteriology and engineering. The marine oil investigation involves the study of conditions favorable to the hydrogenation of seal oil. Work is continuing on a study of the segregation of seal and cod liver oils. Five pages are covered by the report.

The work of the Pacific Fisheries Experimental Station is reported under the following headings: Nutritional requirements of bacteria associated with fish and fish spoilage; antibiotics in fish preservation; test for freshness; freezing British Columbia fish at sea; shellfish processing; antioxidants for frozen fish flesh; other refrigeration investigations; canning; the Maillard reaction in relation to canned and other products; fish curing; biological feeding value of herring meal, fish solubles, and related products; microbiological activity of fish byproducts; studies concerned with cobalamins (forms of vitamin B_{12}); other fish meals and solubles; composition of fish oils; whale liver oils; and miscellaneous. The report covers 16 pages.

A list of the publications of the Research Board is included. The entire report covers 231 pages.

3.18 DISINFECTION OF FISH BOXES

Riemann, H.
Konserves 11, No. 2, 21-23 (1953)

A 2 minutes dip in a sodium hypochlorite solution containing 3 percent available chlorine killed all bacteria on the wooden pieces.

3.18 THESE STREAMLINED PRACTICES CUT PACKERS' CLEANING COSTS

Tucker, Ken C. and Fiske, Rudy
Food Engineering 25, No. 9, 91 (September, 1953)

Heavy carbonized soil is quickly removed from smokehouse walls by spraying with hot cleaner solution.

3.19 BREAKING THE HEAT BARRIER

Anonymous
National Provisioner 129, No. 9, 8 (August 29, 1953)

The article reports on research being conducted on preservation of food products with cathode rays.

3.230 BRITAIN ISSUES FISH FREEZING CODE

Anonymous
Quick Frozen Foods 16, No. 3, 64 (October, 1953)

(Abstract of this article appears under 9.3 page 17 - January, 1954 issue)

3.230 SOME ASPECTS OF REFRIGERATION AS APPLIED TO THE FISHING INDUSTRY

Lantz, A. W.
Canadian Fisherman 40, No. 8, 13 (August, 1953)

3.230 MODERN COLD STORAGE PLANT DESIGN

Peterson, Howard
Industrial Refrigeration 125, No. 5, 23 (November, 1953)

3.230 ZERO STORAGE FACILITY FEATURES REFLECTIVE INSULATION

Anonymous
Refrigerating Engineering 61, No. 11, 1193 (November, 1953)

Six layers of an aluminum foil-to-paper laminate, lapped and stapled to the inside of the building was the only insulation used on the walls and ceiling.

3.238 WATER-BARRIER MATERIALS

Downs, M. L.
Modern Packaging 27, No. 1, 144 (September, 1953)

3.238 RAY-STERILIZING FOOD WRAPPERS

Kempe, L. L.; Graikoski, J. T.; and Brownell, L. E.
Food Engineering 25, No. 11, 55-56, 174 (November, 1953)

(Abstract of this article appears under 3.19 page 19 - January, 1954 issue)

3.238 PACKAGING PROBLEMS IN THE PREPARATION OF HIGH QUALITY FROZEN FILLETS

Herrmann, C.
Fischw. - u. Feinkostind. 24, 167-168 (1952)
Food Science Abstracts 25, No. 4, 393 (July, 1953)

The importance of suitable packaging materials is stressed. During storage at -18° C. and 80% relative humidity, the loss in weight of frozen fish fillets should not exceed 0.8% in a year.

3.238 THE USE OF VEGETABLE PARCHMENT IN PACKAGING FISHERY PRODUCTS

Burke, Thomas J.
Fishing Gazette 70, No. 9, 64 (September, 1953)

(Abstract of this article appears under 2.43 page 15 - December, 1953 issue)

3.238 ANTIOXIDANTS FOR FOOD PAPERS

Bentz, R. W.
Modern Packaging 27, No. 1, 141-143 (September, 1953)

(Abstract of this article appears under 4.64 page 7)

3.238 TRENDS IN FOOD PACKAGING TECHNOLOGY

Anonymous
Journal of Agricultural and Food Chemistry 1, No. 16, 978 (October 28, 1953)

3.7 SMOKE CURING AND DRYING

Anonymous
Report of the Food Investigation Board (Great Britain) for the Year 1952, 35-36 (1953)

(Abstract of this article appears under 3.4 page 7 - December, 1953 issue)

3.8 RESEARCH ON THE MARINATED FISH. I. ON THE SWELLING OF FISH MUSCLE IN ACID SOLUTION

Noguchi, E.; Kizaki, G.; and Nishida, Y.
Bulletin of the Japanese Society of Scientific Fisheries 16, No. 12, 25-28 (1951)
Food Science Abstracts 25, No. 2, 141 (March, 1953)

3.8 BACTERIOLOGICAL STUDIES OF SHIOKARA OR "SOUSED SQUID" 4. STUDIES ON THE RIPENING PHENOMENON OF SHIOKARA

Nagao, Kiyoshi
Bulletin of the Faculty of Fisheries, Hokkaido University 3, No. 4, 259 (March, 1953)

The action of autolyzing enzymes and bacterial enzymes as affecting the ripening of Shiokara under several conditions was observed by determining the amount of amino-nitrogen and free amino acids.

4.5 THE AUTOXIDATION OF SHARK-LIVER OIL

Nair, P. V. and Ramakrishnan, T. A.
Bull. Central Research Inst. Univ. Travancore, Trivandrum Ser. A. 1, 1-34 (1950)
Chemical Abstracts 47, No. 11, 5699-5700 (1953)
Journal of the Americal Oil Chemists' Society 30, No. 8, 343 (August, 1953)

(Abstract of this article appears under 4.61 page 19 - December, 1953 issue)

4.5 SUITABILITY OF PEROXIDE TEST AS A MEASURE OF RANCIDITY IN FATS AND OILS

Bose, S. M. and Subrahmanyan, V.
Bull. cent. Food Tech. Res. Inst. 2, 151-152 (1953)
Food Science Abstracts 25, No. 6, 679 (November, 1953)

(Abstract of this article appears under 7.872 page 9)

4.5 DETERIORATION IN FROZEN PORK AS RELATED TO FAT COMPOSITION, STORAGE TEMPERATURE, LENGTH OF STORAGE PERIOD, AND PACKAGING TREATMENT

Palmer, Arno Zane
Univ. Microfilms, Ann Arbor, Mich. Pub. No. 3854
Dissertation Ab. 12, 364-5 (1952)
Chemical Abstracts 47, No. 4, 1862 (1953)

6.130 PROBLEMS OF NORTHERN NORWAY

Arefjord, M.; Arnesen, E.; Eriksen, L.; Sand, G.; and Gloppestad, E.
Meldinger fra SSF, No. 5, 89-112 (September, 1953)

(Abstract of this article appears under 2.03 page 11)

6.131 ANSWER TO MODERN DRYING

Anonymous
Fishing Gazette 70, No. 10, 56 (October, 1953)

A new and revolutionary dryer recently installed in a New Jersey menhaden plant is described.

6.237 STUDIES ON THE MOLECULAR DISTILLATION OF WHALE LIVER OILS -- I.

Yamakawa, Takeshige and Mori, Takajiro
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 11, 645 (1953)
(English summary, tables and figures)

The yield of each of the distillates and its vitamin A potency is tabulated; the absorption curves of each fraction are shown.

7.81 DETERMINATION OF FRESHNESS OF MEAT BY FORMOL TITRATION WITH MIXED INDICATOR

Kolobolotskii, G.
Myasnaya Ind. S.S.S.R. 23, No. 5, 74-7 (1952)
Chemical Abstracts 47, No. 4, 1861 (1953)

7.82 A STUDY ON THE PRESERVATION OF FISH CAKE--II. DETECTION OF VOLATILE ACID IN FISH CAKE BY PAPER CHROMATOGRAPH

Uchiyama, Hitoshi and Yokoyama, Wakichi
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 12, 718 (1953)
(English summary, figures and tables)

7.86 THE LABORATORY EXAMINATION OF CANNED FOODS. II. ROUTINE MICROBIOLOGICAL EXAMINATIONS

Scott, W. J.
Food Preservation Quarterly 13, No. 2, 21 (June, 1953)

7.871 THE THIOBARBITURIC ACID TEST FOR BUTTERFAT OXIDATION

Biggs, D. A. and Bryant, L. R.
Canadian Journal of Technology 31, No. 6, 138 (June, 1953)

LIST OF PUBLICATIONS REGULARLY ABSTRACTED

Analyst
Analytical Chemistry
Archives of Biochemistry and Biophysics
Atlantic Fisherman
Australian Journal of Marine and Freshwater Research
Biochemical Journal
Bulletin of the Faculty of Fisheries, Hokkaido University
Bulletin of the Japanese Society of Scientific Fisheries
California Fish and Game
Canadian Fisherman
Canadian Journal of Chemistry
Canadian Journal of Technology
Canner
Chemical Abstracts
Chemical and Engineering News
Chemical Engineering
Chemistry and Industry
Commercial Fisheries Review
Commercial Fisherman
Drug and Cosmetic Industry
FAO Fisheries Bulletin
Federation Proceedings
Feedstuffs
Fisheries Newsletter (Australia)
Fish. Res. Bd. Can., Prog. Repts. Atlantic Coast Stas.
Fish. Res. Bd. Can., Prog. Repts. Pacific Coast Stas.
Fisherman
Fishermen's News
Fishing Gazette
Flour and Feed
Food Engineering
Food Manufacture
Food Packer
Food Preservation Quarterly
Food Processing
Food Research
Food Science Abstracts
Food Technology
Foreign Commerce Weekly
Frosted Food Field
Industrial and Engineering Chemistry
Industrial Refrigeration
Journal of Agricultural and Food Chemistry
Journal of Applied Chemistry
Journal of Biological Chemistry
Journal of Home Economics
Journal of Nutrition
Journal of the American Chemical Society
Journal of the American Dietetic Association
Journal of the American Oil Chemists' Society
Journal of the Association of Official Agricultural Chemists
Journal of the Fisheries Research Board of Canada
Journal of the Science of Food and Agriculture
Maine Coast Fisherman
Meldinger Fra SSF (Herring Industry, Norway)
Modern Packaging
Modern Refrigeration
National Provisioner
Nature
Nutrition Reviews
Pacific Fisherman
Pan American Fisherman
Poultry Science
Practical Home Economics
Progressive Fish-Culturist
Quick Frozen Foods
Refrigerating Engineering
Report of the Food Investigation Board (Great Britain)
Science
Southern Fisherman
Trade News (Fisheries Department, Canada)
Western Fisheries
World Fishing

Articles chosen for abstracting or inclusion as bibliographical references are those deemed of interest to the commercial fisheries and to fishery technological laboratories. Occasionally pertinent articles from sources other than the above listed publications are included. Biological papers are generally omitted.

8.51 PROTEINS OF MARINE ALGAE

Coulson, C. B.
Chemistry & Industry, No. 38, 997 (September 19, 1953)

(Abstract of this article appears under 6.3 page 9 - January, 1954 issue)

8.53 THE COMPOSITION OF THE BLUBBER FAT OF CRABEATER SEAL

Winter, G. and Nunn, W.
Journal of the Science of Food and Agriculture 4, No. 9, 439-442 (September, 1953)

(Abstract of this article appears under 4.14 page 15 - January, 1954 issue)

8.59 HEPARIN-LIKE ANTICOAGULANTS FROM MOLLUSCA

Frommhagen, Laurence H.; Fahrenbach, Marvin J.; Brockman, John A.; and Stokstad, E. L. R.
Proc. Soc. Exptl. Biol. Med. 83, 280-3 (1953)
Chemical Abstracts 47, No. 11, 5564 (1953)

8.59 ARGININE AND DEOXYRIBONUCLEIC ACID CONTENT OF ERYTHROCYTE NUCLEI AND SPERMS OF SOME SPECIES OF FISHES

Vendrely, R. and Vendrely, C.
Nature 172, No. 4366, 30 (July 4, 1953)

8.6170 CONTENT OF VITAMIN A IN COMMERCIAL FISH OF ENISEI RIVER AND IN THE FAT OF DELPHINAPTERUS LEUCAS

Mironova, T. N.
Akad. Nauk S. S. S. R., Inst. Biokhim. im. A. N. Bakha, Vitaminnye Resursy i Ispol'zovanie, Sbornik 1, 222-232 (1951)
Chemical Abstracts 47, No. 11, 5630 (1953)

High concen. of vitamin A is found in the liver fat of Stenodus leucichthys (about 90,000 I. U./g.), Hicho taimen (about 55,000), and Coregonus autumnalis (up to 6,200 I. U.). Some 12 other species have very much lower vitamin content. The above mentioned species generally increase their vitamin concn. with age and size. Delphinapterus leucas carries up to 230 I. U./g. of liver fat. It was noted that the high vitamin A content of S. leucichthys and H. taimen can cause difficulties when used as food (human or exptl. animals) by producing vitamin A hypervitaminosis.

8.6170 CONTENT OF VITAMIN A IN THE LIVER AND OTHER INTERNAL ORGANS OF COMMERCIAL FISH AND PORPOISES OF BALTIC AND AZOV-BLACK SEA BASINS

Perepletshik, R. R.
Akad. Nauk S. S. S. R., Inst. Biokhim. im A. N. Bakha, Vitaminnye Resursy i Ispol'zovanie, Sbornik 1, 139-158 (1951)
Chemical Abstracts 47, No. 11, 5629-5630 (1953)

I. Content of Vitamin A in Fish of Baltic Basin
II. Content of Vitamin A in Fish of Azov-Black Sea Basin

8.8 DETERMINATION OF NITROGEN BASES, ESPECIALLY TRIMETHYLAMINE, IN MEAT OF FISH ACCORDING TO CONWAY AND BYRNE'S METHOD

Johnson, Folke
VI Nord. Veterinarmotet, 197-202 (1951)
Chemical Abstracts 47, No. 11, 5575 (1953)

In marine fish and fish from brackish water, freshness is judged by detn. of nitrogen bases, especially Me_3N; Me_3N is not formed in fresh-water fish. Me_3N and total volatile N (I) contents of fresh herring (Clupea harengus) are 0.2-3.4 and 12-22.4 mg./100 g., resp., in spoiled herring, 8-12.4 and 36.5 mg. In codfish from the East China Sea Me_3N is 0.6-3.6 mg. and I is 9-14.5 mg./100 g.; in codfish from the Atlantic Ocean the values are 1.1-4.5 and 7-14.6 mg., resp. In fresh pike (Esox lucius) Me_3N is 0.4-3.4 and I 8.4-15.4 mg./100 g., and in spoiled pike Me_3N is up to 5 and I up to 24.4 mg./100 mg.

8.8 ISOLATION OF TRIMETHYLAMINE OXIDE IN SOME INDIAN MARINE FISHES

Venkataraman, R. and Chari, S. T.
Current Science 22, 86 (March, 1953)

(Abstract of this article appears under 7.81 page 11 - January, 1954 issue)

9.12 FISH MARKING IN THE ARCTIC FISHERIES

Trout, G. C.
World Fishing 2, No. 10, 389 (October, 1953)

9.17 STUDIES ON FISH PRESERVATION AT THE CONTRA COSTA STEAM PLANT OF THE PACIFIC GAS AND ELECTRIC COMPANY

Kerr, James E. (Bechtel Corporation)
State of California Department of Fish and Game, Fish Bulletin No. 92 (1953)

9.19 VITAL STATISTICS OF FISH POPULATIONS

Gulland, J. A.
World Fishing 2, No. 8, 316 (August, 1953)

9.4 NEW FISHERIES LABORATORY, BURNHAM-ON-CROUCH

Cole, H. A.
Nature 172, No. 4383, 790 (October 31, 1953)

A new laboratory for research on inshore and shellfish problems was formally inaugurated at Burnham-on-Crouch, Essex on September 23, 1953.

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